COMMUNICATIONS SUPPORT FOR HEALTH PROGRAM (CSH)

FINAL FORMATIVE RESEARCH REPORT: NUTRITION BEHAVIOURS AMONGST HOUSEHOLDS IN ZAMBIA-A MATERNAL AND CHILD HEALTH STUDY TO EXPLORE FACTORS RELATED TO NUTRITION AND PREVENTION OF CHILDHOOD ILLNESS

CONTRACT NO: GHS-1-007-00004-00, ORDER NO. 1-05-07-00004

January 2013

CONTENTS

Executive Summary

In September 2012, to address the high rates of malnutrition problems in Zambia, the Communications Support for Health (CSH) programme in Zambia designed and implemented a formative research study focused on the nutrition behaviours amongst pregnant women, breastfeeding mothers, and mothers with children under 2 years of age. The primary objective of this study was to establish influencing factors pertaining to child dietary intake—mainly complementary feeding and breastfeeding—and to explore the influencing factors for maternal diet during pregnancy and breastfeeding in Zambia and the feasibility of changing unhealthy practices. Findings from this research will be used to inform the design of the national campaign focused on improving the nutritional status of pregnant women, breastfeeding mothers, and children under the age of 2.

Methodology

The research described in this report was a qualitative study using two types of research methodology, trials of improved practices (TIPs) and in-depth interviews (IDIs). TIPS was conducted with pregnant women and mothers of children 0-5 months, 6-8 months, 9-11 months, and 12-23 months. TIPS consisted of three stages:

Stage 1: Interview and observation of existing nutrition behaviours and dietary recall,

Stage 2: Recommendation and negotiation of behaviour change, and

Stage 3: Interview and observation of the results of the trial and dietary recall.

IDIs were conducted with fathers of children less than 2 years of age or male partners of mothers of children under 2 years, and elderly women.

This study was conducted in the urban and rural/peri-urban areas of Luapula (Mansa and Samfya districts), Eastern (Chipata and Lundazi districts), and Southern (Choma and Pemba districts) provinces of Zambia.

The target recruitment for this study was 144 interviews. However, due to difficulties in completing second and third visits with some pregnant women and mothers, the sample for analysis consists of 117 interviews.

Summary of Findings

Breastfeeding

The study revealed that women practised most of the ideal breastfeeding behaviours. A vast majority of mothers are exclusively breastfeeding. On average, mothers plan to breastfeed for 19 months. Despite the strong commitment to breastfeeding, many mothers need to increase the length of breastfeeding sessions and make sure that they use and empty both breasts. Many mothers also need to improve their positioning to facilitate more effective feeding sessions. Findings demonstrated that often children were not getting an adequate amount of breast milk and, by making simple changes in the duration and technique, mothers noticed an almost immediate difference in their children's disposition.

Replacement or Complementary Feeding

Most mothers also followed guidance in delaying the provision of solid foods until their child is 6 months old. Specifically, the vast majority of mothers of children 0-5 months old exclusively breast fed. However, mothers lack awareness of the importance of introducing a variety of nutritious foods into their children's diet. Children 6-8 months old predominately ate watery porridge, while children 9-11 months old ate more solid foods, such as nshima. Most of these mothers often feed their children non-nutritious foods, and do not provide mashed fruits, vegetables, and proteins. While children 12-23 months old appeared to be transitioning to the same diets of other family members, they still lacked the variety and sufficient amount of nutritional foods. In many cases, mothers also fed their children from a communal plate and did not account for the amount of food their children ate.

Maternal Diet

Mothers do not adjust their diets during pregnancy or breastfeeding. Results of the trials demonstrated that mothers lack fruits, vegetables, and protein in their diets and have an overall insufficiency in the number of daily snacks and meals. Although mothers are cognisant that they should maintain a balanced diet, accessibility and affordability of certain foods prevent them from improving their daily intake.

Based on observations and interviews, mothers are primarily responsible for buying and preparing the family food. Fathers are generally viewed as the primary income provider, but they rely on their wives or female partners to make the decisions about which foods to buy and prepare. A vast majority of the male partners did not display a common knowledge of special foods that should be available to pregnant women, breastfeeding mothers, and young children.

Hygiene and Illness

Observations revealed unhealthy practices, including unclean water used for drinking, cooking, and cleaning; unsafe water storage; and lack of consistent hand washing with soap. Mothers are not aware of other foods that can be given to a sick child. As a result, they resort to overfeeding or giving non-nutritious fluids such as sugary drinks due to the child's lack of interest in breast milk or other nutritious options.

Personal Influencers

Women most commonly viewed staff from local health clinics as a trusted source for health information on maternal and child nutrition. They also relied on their friends, family, and elderly women for information. Grandmothers and elder women provide advice to their daughters and young mothers on child feeding practices, such as when to introduce other foods and liquids to a child. In addition, they teach women and advise them on traditional cooking practices. However, they need to be more informed on what kinds of food, and how much food, pregnant women and breastfeeding mothers should consume.

Male partners also served as a source of support for women by purchasing healthy foods when funds were available. They offered encouragement to implement behaviour change recommendations, but

appeared to be unaware of the appropriate breastfeeding and nutritional guidelines for children, nursing mothers, and pregnant women.

Food Availability

Food availability and the ability to buy food are major concerns for all target audiences. Mothers are primarily responsible for the food prepared for the family, with strong support from their husbands. However, food availability, particularly some fruits and vegetables, appears to have a notable influence on the ability of mothers to implement recommendations. As illustrated in the findings, rural households experienced the greatest impact from seasonal food shortages. Certain seasons of the year, particularly the rainy season, place limitations on the availability of some foods by reducing the local accessibility of foods and increasing the cost of some foods for purchase. Urban households reported less of a problem in accessing healthy foods year long, but highlighted the increase of costs of some foods during shortages.

Male partners appeared to be most concerned about their ability to purchase and harvest healthy foods for their female partners and children. Some households established coping strategies such as drying foods in preparation for the shortages, while other households are forced to reduce the number and size of meals.

Results in Behaviour Change

Behaviours most easily changed in the trials, and most likely to change as a result of the campaign, were all related to breastfeeding. These include positioning, use and emptying of both breasts, and increase length of sessions.

Prior to the recommendations, mothers mentioned that their children appeared to be hungry despite their efforts to breastfeed frequently. In most cases, mothers were not aware of the need to improve how they breastfed their children. They seemed to be very receptive to the above recommendations and reported an increase in breast milk and a decrease in crying amongst children as a result of these changes.

Behaviours most difficult to change in the trials, and most likely requiring an approach focusing on strategies to address barriers, most commonly pertained to the material diet and complementary feeding of children. These included increases in healthy foods (e.g. fruits), number of meals and snacks, and portion sizes. Another behaviour that was difficult to changes was properly treating drinking water.

Food availability served as a significant barrier for all of the recommendations pertaining to maternal and child diet. Despite the initial lack of awareness of the components of a healthy diet, the trials proved that local accessibility and affordability of certain foods year round deterred their interest in changing these behaviours.

In terms of treating water, some mothers demonstrated a belief that their water was safe or had already been treated at the place of collection. This belief could be exacerbated by the existing social norm of not treating water and another common belief that diarrhoea is caused by teething, and not unclean water or poor hygiene. After accepting the recommendation to treat water, mothers did not change

this behaviour due to a lack of accessibility and affordability of chlorine or the perception that boiling would be time consuming.

Recommendations

Messaging

The findings illustrate the importance of focusing messaging on behaviours that proved to be most in need of change including specific breastfeeding practices, balanced diets for mother and child, and proper hygiene. Messaging should highlight both the immediate and long-term benefits of the behaviour changes. If possible, the campaign should also include secondary messaging on other healthy behaviours such as recuperative feeding of sick children. Messages should also include vignettes of women who have changed their nutrition behaviours and have seen the benefits of these changes in their own health and that of the children.

Target Audiences

As initially planned, the campaign should focus on pregnant women and mothers of children under 2 years of age as the primary audiences, and male partners and elderly women as the secondary audiences. Campaign development should also incorporate health clinic staff as both a secondary audience and communication channel because they were reported to be the most influential source of information on maternal and child nutrition.

Communication Channels

Interpersonal communications is the primary source for information on nutrition for this target audience. The most effective channel for interpersonal communications would be through health clinic staff. To fully take advantage of this channel, communications materials could include guidance documents to be used by clinics and materials available at clinics for women to use. Materials, particularly those for women, should include easy -to-understand instructions and illustrations demonstrating the behaviours.

Another source of information, and possible channel, is other women in the community. Campaign community events would help convene mothers and other influencers to share key campaign messages, demonstrate healthy feeding behaviours, and discuss strategies for addressing barriers such as food shortages and proper breastfeeding practices.

Introduction

Good nutrition is essential for healthy and active lives and directly affects the intellectual capacity of human beings, which eventually impacts the possibility for the social and economic development of a country. The most critical period for influencing both physical and intellectual development of a child through nutrition is in the first 1,000 days of his or her life, starting at the moment of conception and continuing through the first 2 years after birth. Further, the achievement of high nutritional status (and subsequent appropriate physical and intellectual development) amongst Zambians is anchored on the application of appropriate diet and healthy lifestyles, which in turn are dependent on stable and sustainable food security, supportive caring practices, a healthy environment, and accessible quality health services (USAID 2003).

In Zambia, the levels of malnutrition, measured through rates of stunting, are very high and have remained that way for a long time. In the 2007 Zambia Demographic and Health Survey (ZDHS), 45 percent of children were stunted, 5 percent were wasted, and 15 percent were underweight. The highest prevalence of stunting is in the rural areas (48 percent), as compared to 39 percent in the urban areas (Central Statistical Office et al. 2009).

The process of stunting occurs during the period from conception (during pregnancy) through the first 2 years of a child's life—or in the first 1,000 days. Stunting in children has far-reaching, irreversible negative health consequences, which affect the quality of life. In order to address the high rates of malnutrition problems in Zambia, the Ministry of Health (MOH), in collaboration with the U.S. Agency for International Development (USAID)-funded Communications Support for Health (CSH) project and other partners, launched a national "1,000 most critical days" nutrition campaign to promote improved practices and care-seeking behaviours.

In order to develop a meaningful campaign that would effectively improve feeding practices and behaviours amongst pregnant women, breastfeeding mothers, and mothers with children under 2 years of age, CSH designed and implemented a formative research study focused on the nutrition behaviours of these key audiences. The primary purpose of this study was to explore the factors influencing young children's dietary intake and maternal diet during pregnancy and breastfeeding. Findings from this research should inform the design of the national campaign focused on improving the nutritional status of pregnant women, breastfeeding mothers, and children under the age of 2.

Identified Research Gaps

To inform the development of the protocol for the formative research study, CSH conducted a literature review of the most recent studies and data related to nutrition in Zambia. The literature review revealed a number of gaps in need of investigation.

- According to the reviewed studies, men support nutrition by providing the money to buy food, but women are the ones who actually decide what to buy. The studies elaborate on the seasonality of food, especially for agricultural communities. However, these studies do not describe how or if agricultural community residents' diets change by season and if they have

devised any coping strategies to obtain enough food and variety throughout the year, especially for pregnant and lactating women and children.

- The studies did not clearly elaborate on the feeding practices amongst mothers of young children and the steps women take to ensure that young children aged 6 months to 2 years are fed the right quantities and qualities of food to achieve good health.
- The studies did not clearly show how or where women learn about nutrition issues, especially for pregnant women.
- The reviewed studies were also silent on how mothers feed sick children and children recovering from an illness.
- The reviewed studies also did not provide information on the feasibility and motivators behind changing feeding practices to healthier options.

Formative Research Rationale

This formative research was designed to supplement existing evidence to inform the redesign of the on-going national nutrition campaign, which includes the development of messages and strategies, as well as the identification of community partnerships being implemented by MOH with CSH support.

Research Main Objective

The primary objective of this study was to establish influencing factors pertaining to child dietary intake—mainly complementary feeding and breastfeeding—and to explore the influencing factors for maternal diet during pregnancy and breastfeeding in Zambia and the feasibility of changing unhealthy practices.

Research Questions

1. What factors influence pregnant and breastfeeding women's feeding/nutrition behaviours and proper feeding for infants and children up to 2 years of age?
2. How feasible is it to change the nutrition-related practices of pregnant women, breastfeeding mothers, and mothers of children under 2?
3. What do mothers and pregnant and breastfeeding women learn about healthy nutrition behaviours?
4. From whom do pregnant women, mothers, and breastfeeding mothers learn about healthy nutrition behaviours?
5. What do families do to cope or adapt to the changes in food availability during different seasons of the year?
6. What do women do to achieve good hygiene and prevent diarrhoeal diseases for their children?
7. What messages, channels, and communications strategies are likely to encourage healthy nutrition behaviours amongst women and pregnant and breastfeeding mothers?

Research Methodology

Type of Study

In order to identify ways to improve the nutrition behaviours of the target audiences, this study used two types of research methodology: Trials of Improved Practices (TIPs) and in-depth interviews (IDIs).

TIPs is a formative research method that helps programme planners to select and pre-test actual practices that the programme is geared to promote. CSH used TIPs to identify practices and behaviours that people are both willing and able to do, barriers and motivations for feasible practices, and potential strategies to promote these feasible practices. TIPs offers information that is useful in developing behavioural change strategies and activities. It should be noted that TIPs works with behaviours at a micro level. The study aimed at exploring and achieving ideal practices such as exclusive breastfeeding, the appropriate recommended consumption of diverse nutrients, and the quantity and frequency of meals, but always under the premise that participants will move towards the ideal practices in steps at a pace that is most feasible for them. Rather, TIPs examined the challenges that people were having in practising the ideal behaviour and, by breaking down this behaviour into smaller sub-behaviours (e.g., for exclusive breastfeeding: feeding on demand, positioning the baby correctly, emptying both breasts with each feed, expressing milk as needed) and asking the audience to "try" them, the programme gained a better understanding of what exactly constitutes the problem as well as which solutions are actually feasible for people to adopt.

The implementation of TIPs was conducted in the following three stages:

Stage 1

During this stage, researchers made their first visit to the households. Potential respondents were screened for eligibility based on the screening protocol. After selecting suitable respondents, researchers implemented the study. At households, researchers first conducted an observation of nutrition-related behaviours and practices. This process involved observing what households prepare (cook) for specific meals, how they prepare food, and finally how they eat, particularly how they serve and feed their young children. Women were also observed on their breastfeeding practices and hygiene. Researchers planned observations prior to and over the course of a meal with the participant in order to be able to observe both the preparation and serving of the meal. The observations took approximately 2–3 hours.

Observations were followed by discussions of observed and current nutrition behaviours and practices with the participants, along with their motivations and barriers to practising the desired behaviours. Observations were based on a pre-designed checklist of desired behaviours and practices on nutrition and were followed by a discussion of current nutrition behaviours and practices, as well as the motivators and hindrances to the practice on the desired behaviours.

The discussions were guided by pre-designed IDI guides. IDIs allowed researchers to explore the reasons for practising the observed behaviours, and they also explored other behaviours, enabling factors, and barriers to practising healthy nutrition behaviours.

During the interview stage, current and retrospective nutrition behaviours were investigated. IDIs were used to explore actual nutrition decisions made by study participants by asking participants what foods they prepared and how they decided what to prepare, sources of food, knowledge of food varieties, and other related questions for pregnant women, children, and lactating mothers within the 24 hours before the interview. After the discussion, the research team asked participants for consent to participate in a follow-up discussion, which took place about 2 days after the initial discussion. In between the first and second visits, the research team analysed the data from the discussion and observations and identified two to four behaviours/practices they would like the target audience to improve upon. IDIs lasted approximately 90 minutes.

Stage 2

The second stage involved going back to the households of participants who consented to take part in the follow-up discussions and negotiating with them on the behaviours they were willing and able to improve upon. After participants reached an agreement on anywhere from two to four specific improved practices/behaviours they were willing to try, the research team in consultation with a nutrition expert then recommended to the target audiences the desired behaviours and practices they should try. The target audiences were provided with specific instructions on how to improve specific practices. The researchers discussed the feasibility of implementing the instructions and the possible need to alter the instructions. The researchers agreed with the target audiences on a time to conduct the feedback session within 2 weeks after the first visit. The second interview lasted approximately 1 hour.

Stage 3

During the third visit, which occurred within 2 weeks after the second visit, the target audiences were followed up with and interviewed to obtain feedback on the outcomes of the trials, whether they tried the practices or not, what worked well and what did not work well, what their feelings were about it, whether they modified the practices, and whether they experienced ease or difficulties in using the practices, amongst other discussion items. The third interview lasted approximately 90 minutes.

The second method used to complement the findings from TIPs was a series of IDIs. These interviews were conducted with the secondary target audiences, fathers of children under the age of 2, male partners of pregnant women, and grandmothers of children aged 0–2 years or elderly women who have an influential role in advising the mothers of children aged 0–2 years.

Study Audiences

Primary Target Audience

The primary audience for this study was women aged 18–49 years who were pregnant—to facilitate the investigation of nutrition behaviours during pregnancy—and mothers of children aged 2 years and younger. They were interviewed on both their nutrition as lactating mothers and on their child's nutrition behaviours and practices.

Secondary Target Audience

The secondary audiences for this study were as follows:

1. Males aged 18–49 who are partners of pregnant women or fathers of children aged 2 years and younger. They were interviewed on maternal and child nutrition and their roles in supporting maternal/child nutrition.
2. Grandmothers of children aged 0–2 or elderly women who have an influential role in advising the mothers of children aged 0–2 years. They were interviewed on what their role is in the nutrition of pregnant women, mothers of children under the age of 2, and breastfeeding mothers, and on how they support child nutrition behaviour and practices.

Study Setting

This study was conducted in the urban and rural/peri-urban areas of Luapula (Mansa and Samfya Districts), Eastern (Chipata and Lundazi Districts), and Southern (Choma and Pemba Districts) provinces of Zambia. These provinces were selected based on their prevalence of childhood stunting. Luapula and Eastern provinces represent the highest prevalence of stunting in children. The MOH provincial health offices advised on priority districts within each of the provinces for the study.

Participants were randomly selected from purposively identified health centres' catchment areas within the selected districts. Selection of health centres was based on performance against stunting of children, cases of malnutrition, and antenatal care (ANC) attendance, which was provided by provincial MOH offices.

Segmentation Matrix

The target recruitment for this study was 144 interviews, as outlined in the segmentation matrix below. However, it was difficult in some cases to complete the second and third visits. In some instances, the transcripts for the interviews were not readily available in time for the analysis. As result, those interviews were not included in the findings. Table 1 shows the breakout of the final sample of 117 participants who completed the TIPs and IDIs.

Table 1: Segmentation of Target Audiences

Target Audience	Rural	Urban	Total Completed	Total Transcripts Received and Analysed
Pregnant women	12	12	24	21
Mothers of children aged 0–5 months	12	12	24	17
Mothers of children aged 6–8 months	12	12	24	19
Mothers of children aged 9–11 months	12	12	24	19
Mothers of children aged 12–23 months	12	12	24	23

Target Audience	Rural	Urban	Total Completed	Total Transcripts Received and Analysed
Fathers of children under the age of 2 years/male partners of pregnant women	6	6	12	9
Grandmothers of children under the age of 2 years	6	6	12	9
Total	**72**	**72**	**144**	**117**

Recruitment Procedure

Pregnant women and mothers of children aged 0–2 years were purposively selected and recruited both from the health centres and from households by trained interviewers.

Male partners and grandmothers/elderly women were purposely selected and recruited from the same households where pregnant women and mothers of children aged 0–2 were selected. The following steps were used to select male partners and grandmothers/elderly women from households:

1. After conducting the first observation and interview with a selected participant (either a pregnant woman or mother of a child aged 0–2), the interviewer asked the participant if she had a male partner and/or a mother or mother-in-law who would be willing to participate in an interview.
2. The participant introduced the potential participant to the research team.
3. The research team conducted independent screening of potential participants to assess their eligibility.
4. Eligible participants were asked for their willingness to participate, based on the information sheet and consent procedures.
5. Willing participants were identified, and then a time was set up for the interviewer to visit the participant in the household and conduct the interview.

In the event that an inadequate number of male partners and grandmothers/elderly women were recruited from households using the method described above, additional participants were recruited through community health workers from each of the selected areas. The following steps were used for recruiting these participants:

1. The community health worker identified potential participants.
2. The community health worker introduced the potential participant to the research team.
3. The research team conducted independent screening of potential participants to assess their eligibility.
4. Eligible participants were asked for their willingness to participate, based on the information sheet and consent procedures.

5. Willing participants were identified, and then a time was set up for the interviewer to visit the participant in the household and conduct the interview.

Data Collection

Study Tools

This study used two main tools: an observation checklist and semi-structured interview guides. In total, there were five semi-structured interview guides. A different semi-structured interview guide was used for each of the three visits with the pregnant women and mothers of children aged 0–2, as different questions were used during each visit. Additionally, there was a guide for the interviews with the male partners and one for the interviews with the grandmothers of children aged 0–2/elderly women who play an influential role in advising mothers of children aged 0–2. A copy of the guides and protocols can be found in a Complementary document.

All observations and interviews were conducted at the home of the participant to allow for an in-depth exploration of the home setup and the general home environment that facilitated the understanding of nutrition behaviours at the household level.

Piloting of Research Tools

The interview guides and observation checklists were piloted and revised. Pilot-testing was conducted in Lusaka's Kalingalinga and Mtendere compounds, which were not part of the main study sites. The two areas were purposively selected because they were logistically easy to access—both sites were located close to where the training of research assistants was conducted. Each guide was piloted once by each interviewer. The pilot data collection served as field training for the moderators, note takers, transcribers, and translators.

Although the interview guides were originally written in English, they were translated into Tonga, Nyanja, Kaonde/Lunda, and Bemba, which are the suitable languages for the selected study areas.

Training of Interviewers/Moderators/Note Takers

This study used moderators, note takers, and transcribers to collect the data, take notes, and translate the data. Interviews were conducted by facilitators who were trained in conducting qualitative formative research. All facilitators participated in training by a team of MOH and CSH research, monitoring, and evaluation staff. The training provided a background on the study's research aims and objectives and highlighted qualitative research methods and data collection techniques, including interviewing and negotiation skills, an effective way to conduct observations; consent procedures; ethical considerations; and other relevant information and skills.

The data collection team was recruited based on competence in conducting formative research and in understanding the language of the location where the data collection took place. Additionally, the data collectors were familiar with the nutrition programme in general.

Demographic Forms

A screening protocol was used to guide the recruitment of suitable participants. In this form, demographic information was recorded by the interviewer for each participant prior to commencement

of the interview. The information included demographics on age, marital status, number of children, and residency.

Consent and Interview Procedures

When a household was visited, potential participants were informed of the topic and the objectives of the discussion. This prepared the participant for the discussion. A written consent/assent process was used with each participant. Each participant was given a copy of the consent/assent form to read and was provided with a copy of the signed consent/assent form.

The choice of venue for the interviews was influenced both by finding a location where the privacy of the participant was ensured and by locating a spot with minimal noise, which was important for recording the interview.

Team Composition

The data collection teams were composed of an interviewer, who was responsible for interviewing and guiding the proceedings of the interviews, and the transcribers, who translated, transcribed, and typed the interview data. A note taker assisted in setting up and monitoring the audio equipment and recorded statements generated during the free-listing exercise. The note taker also took notes on the content of the discussion. These notes were used during field work to begin determining emerging themes, identifying new questions to be incorporated into the interview guide, and developing the coding dictionary.

The interviewers and transcribers were supervised by MOH and CSH research, monitoring, and evaluation staff, who conducted field observations and spot checks, participated in a sample of interviews to provide feedback, and ensured that logistics and procedures were adhered to.

Two teams of six interviewers each collected first-round (including the first and second visits) data from the three districts. Each team collected data in one district for the duration of 26 days in Southern Province, 28 days in Eastern province and 29 days in Luapula province. Each of the teams was accompanied by a nutritionist and research personnel from MOH and CSH. On average, data for the third visit were collected for the duration of 12 days across all the data collection sites.

To the greatest extent possible, CSH worked to ensure that all interviewers conducting the observations and interviews with pregnant women and mothers of children aged 0–2 were female. This helped ensure that female participants felt comfortable during the observation and interviews.

Data Management

Transcription and Text Translation

Digital recorders were used to record the data and, after the interview, the audio data were sent to the transcribers for transcription. All interviews were transcribed verbatim, in the language of the respondents. The transcription of data and data collection was conducted simultaneously.

Transcribed text was translated into English by experienced and trained bilingual staff (*typically the moderators and transcribers*). All translated text was complete and **not** summaries of the transcribed

original language. All translations kept the intent of the original statement, while writing in correct English. The translator(s) ensured that the translations were consistent across all text.

A total of 27 transcripts were not readily available in time for the data analysis. As a result, CSH analysed a total of 117 transcripts for this report (see Table 1).

Data Confidentiality

To ensure confidentiality, one respondent was interviewed at a time and at a secluded location. No identifying information was present, ensuring that the data had no direct link to a particular person. Only project personnel were granted access to the data. To decrease risk of breach of confidentiality, all signed consent/assent forms were kept separate from the data, were stored securely in a locked cabinet after data collection was completed, and were only accessible to those on the research team.

Data Analysis

After the data collection was completed, CSH researchers transcribed the interviews and TIPs results. A small team of CSH researchers then manually analysed the transcripts and TIPs results to develop the report.

Findings

The report presents the results of the household trials and IDIs by each target audience in the following categories:

- Common nutrition behaviours,
- Underlying factors,
- Recommendations and results for change in nutrition behaviours, and
- Summary of findings.

The order of the findings for each target audience includes

- Pregnant women,
- Mothers of children aged 0–5 months,
- Mothers of children aged 6–8 months,
- Mothers of children aged 9–11 months,
- Mothers of children aged 12–23 months, and
- Fathers of children under 2 years of age or partners of pregnant women.

Since the TIPs interviews consisted of three visits, the findings were separated into sections. The first section of the findings includes results from the first visit. The second and third visits are summarised in the section on recommendations and results for change in nutrition behaviours.

Pregnant Women

The following is an analysis of interviews and observations of 21 pregnant women at different stages along their pregnancies. Twelve were in rural locations, and nine mothers were in urban locations. Two of the women had delivered by the time of the third visit, and one woman was not available for the third visit due to illness.

Common Nutrition Behaviours

Maternal Diet

Most pregnant women complained of a loss of appetite, especially during the first 3 to 4 months of their pregnancy. Many of these women also reported experiencing severe nausea. They skipped meals and generally ate smaller quantities of food when they did eat a meal. "I just force myself [to eat] to avoid spoiling things [disturb the health of the child], but many times I don't like eating food, I just sit, especially when I am home alone like now," said a 7-months pregnant woman of Lundazi urban.

Interviews revealed that the diets of pregnant women were predominately influenced by their cravings for specific food, rather than the need to have a balanced diet. "My eating in the first, second, third, fourth, and fifth month was problematic: I became a picky eater. Sometimes, I would even sleep without eating because of poor appetite," said a 9-months pregnant woman of Chipata rural. A few women reported craving and consuming soil despite having full knowledge of and experiencing its negative consequences of recurrent constipation. "Even if they tell me that it's bad for my stomach, I take it [eat soil] because if I don't eat soil I don't feel good," said an 8-month-old pregnant woman of Mwase rural.

The dietary recall demonstrated that these women lacked sufficient amounts of protein and fruit, and most commonly ate nshima with vegetables. On average, the women had two or three meals a day without any snacks. In comparison to their diets prior to pregnancy, the women reported selecting foods based on their cravings and consuming those foods for an extended period of time. They did not increase the amount or frequency of meals or snacks and did not add any food they perceived to be healthy during pregnancy due to lack of availability and mostly because of a lack of resources to buy the required foods. An 8-months pregnant woman of Samfya rural said, "Before I got pregnant, I would eat proper meals. But when the pregnancy was only 3 months, I would only want to eat pumpkins." Other than food cravings, they do not eat any differently from the rest of the family. Rather, the women based their decisions about what food to buy on their available financial resources and what would be enough for the whole family. The section below details the foods that pregnant women believed to be healthy.

Hygiene

Generally, pregnant women used unsafe water drawn from shallow wells or a borehole, while a few used tap water for drinking and general home use. They generally did not chlorinate or treat their water, and most commonly stored it in wide-mouthed containers that included a cup by the side for use by others. Almost all pregnant women showed willingness to improve on how they stored their drinking water, as mentioned by a 6-months pregnant woman from Chipata urban: "I will stop [storing drinking

water in a wide mouthed vessel] because you have told me the disadvantages of storing and drinking water in a bucket."

Many of the pregnant women did not wash their hands when handling food. The few who washed their hands did not use soap or ash. On treating water and hand washing, a 6-months pregnant woman from Pemba rural, who used piped tap water said, "I know that my hands do get dirty, but at times I just forget to wash them. About treating the water: It is clean because it's treated from source by the supplier." Some women mentioned that they simply have never thought about treating their water,

"Just as I have kept on telling you—I have just never thought of it [boiling water] to be important," said a 7-months pregnant woman in Chipata rural.

Most pregnant women did not use a pitcher to pour water when washing hands; they washed their hands from the same vessel and used the same water to wash their hands before eating food. This meant that the first person, usually, the eldest washed their hands with clean water and the water would be very dirty by the time the youngest washed their hands. Most women rarely washed their hands before eating other food stuffs such as fritters, fruits and other snacks. However, most households did keep their foods covered for storing.

Underlying Factors

Personal Influencers and Common Beliefs

The nutrition behaviours of pregnant women appear to be influenced by several factors. Pregnant women commonly mentioned that they ate what was available at home, even if they knew that it would not be most beneficial to them and their children. As mentioned above, their behaviours were also driven by cravings and less so by a commitment to a diet that would support their health and that of their child. "The other reason why I never used to eat these vegetables is that I don't like them; I just don't have interest in those foods," said a 7-months pregnant woman of Chipata rural. Similarly, a 6-months pregnant woman of Pemba rural said that she did not include fruits in her diet simply because she does not have fruits as priority foods: "I just don't think about buying them [fruits] but yes, [I can afford to buy fruits]."

Many pregnant women seemed to understand the negative impact of poor dietary choices on their health, and particularly the health of their unborn child. Almost all of the pregnant women had received at least one ANC visit by the time of the interview, and most reported learning about nutrition during these visits. Some mentioned that they also obtained information about nutrition from their friends, mothers and mothers-in-law, TV and radio, and community elders. A few pregnant women reported attending ANC late in their pregnancy and missing talks on nutrition in health facilities. These women said that their busy schedules did not allow time for attending these lessons, and they did not appear to place much importance on the discussions. A few women who attended ANC reported that the discussions were scanty on nutrition-related topics. "That issue of what to eat during pregnancy is not talked about most of the times; they [health workers] only talk about taking Fansidar and attending antenatal care—that's all," said a rural pregnant woman. For those women who did attend ANC or nutrition-related discussions, they rarely followed the nutritional guidance provided in these lessons. Barriers to following nutritional guidance included insufficient funds to buy healthy foods, lack of local

availability or out-of-season foods, strong desire to soothe food cravings, and the conflict between meeting the needs of the women and the family.

"Most vegetables (bondwe, spinach, kalembula, etc.) are not available here [in our community]; they are only found in town." (Pemba rural, 7-months pregnant woman)

"They do teach us what to eat, but looking at where we live, we are not able to eat what we are told to eat…because of lack of money. So we miss morning meals and our first meal is lunch at 12:00hrs." (Mansa urban, 6-months pregnant woman)

> *"When am given money for food, I have to see how many we are at home, then I buy food worth the amount but enough to curter for everyone at home,"* (Mansa rural, 6-months pregnant woman)

Pregnant women appear to receive a great deal of support from their male partners to achieve better nutrition during pregnancy. "He supports me, he listens [to programmes on health] from the radio—they talk about husbands to be supporting their pregnant wives on issues of nutrition, and he brings me lots of things when I ask for them and [he provides] if he has money," said a 7-months pregnant woman of Lundazi. Almost all of the women said that their male partners supported their diet by providing the money to buy foods perceived to be healthy and also by encouraging them to have a nutritious diet. "He advises me to eat a lot of vegetables, and he gives me money to buy relish," said a 6-months pregnant woman in Samfya rural. Two women underscored that their male partners encouraged them not to eat soil, based on the recommendations. One pregnant woman said that her husband started buying her sweets to help her kill the craving for soil.

Pregnant women believed that foods healthy during pregnancy included fruits such as oranges, apples, and bananas. However, they rarely mentioned the locally available fruits such as masuku and mpundus. Other commonly mentioned foods believed to be healthy included chips, meat, kapenta, fish, milk, chicken, and visashi (vegetables mixed with groundnuts). For animal source foods, almost all rural households reared some birds and animals such as chickens, ducks, goats, pigs, and cattle. They generally keep the chickens for home consumption, and sometimes they sell them to buy other household needs, such as soap. The animals were usually preserved and sold to buy more expensive and periodic household requirements such as school fees.

Discussions with pregnant women revealed huge differences in the availability of foods in urban and rural areas. Pregnant women in urban areas did not find the availability of foods year round to be a problem, but noticed an increase in prices in some foods in different seasons. Rural women mentioned similar increases in price in addition to less availability of certain types of foods, depending on the season. During the rainy season, rural women were generally able to find and eat fresh vegetables that they usually obtained from their fields, but after the rainy season, they relied heavily on dried vegetables and other dried foods for their meals. For a source of vegetables, a few women had home gardens. In both the urban and rural areas, whether one had a home garden or not depended on the availability of a source of water. Very few women had a source of water within their homes (e.g., either tap water or water from the well). In the rural areas, proximity to a stream was also one of the

influencing factors to having a home garden. The few women who had home gardens grew vegetables such as chines cabbage, rape, sweet potatoes for sweet potato leaves, and pumpkin leaves.

Recommendations and Results for Change in Nutrition Behaviours

Table 2 illustrates the recommendations made for change in nutrition and hygiene-related behaviours and the participants' responses to these recommendations.

Table 2: Recommendations and Results for Pregnant Women

Recommendation	Offered	Accepted	Tried	Liked	Adopted
Maternal Diet					
Increase servings of fruits					
• Urban	0	0	0	0	0
• Rural	1	1	0	0	0
Increase the number of daily meals or snacks					
• Urban	8	8	8*	8*	8*
• Rural	7	7	7	7	7
Stop eating soil					
• Urban	2	2	2	2	0
• Rural	1	1	1	1	0
Increase variety of foods eaten, including vegetables					
• Urban	3	3	3	3	3
• Rural	6	6	5	5	5
Take iron and folic supplements					
• Urban	3	3	1	1	1
• Rural	1	1	0	0	0
Hygiene					
Wash hands with soap when handling food and after using the toilet					
• Urban	1	1	1	1	1
• Rural	3	3	3	3	3
Boil or chlorinate water for drinking or for cleaning dishes					
• Urban			0 Ω	0 Ω	0 Ω
• Rural	62	62	2 π	2 π	2 π
Store drinking water in closed or narrow-mouthed container					
• Urban		2	1*	1*	1*
• Rural	22	2	0	0	0

*This recommendation was given to one participant who was not available for the third visit to assess the implementation of the recommendations and whose responses are not included in this number.

Ω This recommendation was given to six participants who were not available for the third visit to assess the implementation of the recommendations and whose responses are not included in this number.

π This recommendation was given to three participants who were not available for the third visit to assess the implementation of the recommendations and whose responses are not included in this number.

The below table details the changes that mothers were able to make in the diets of their children based on their dietary recalls.

Table 3: Specific Changes in Maternal Diet

Cases	First Visit	Second Visit
Increase number of meals to three main meals and at least one snack		
Mother 1	• 3 meals	• 5 meals
Mother 2	• 2 meals	• 5 meals
Mother 4	• 3 meals	• 5 meals
Mother 7	• 3 meals	• 5 meals
Mother 9	• 3 meals	• 4 meals
Mother 12	• 3 meals	• 4 meals
Mother 13	• 3 meals	• 6 meals
Mother 14	• 4 meals	• 6 meals
Mother 16	• 2 meals	• 4 meals
Mother 17	• 2 meals	• 3 meals
Mother 20	• 2 meals	• 5 meals
Stop eating soil		
Mother 1	• 5 servings of soil daily	• 3 servings of soil in 14 days
Take iron supplements as recommended by health workers and eat iron-rich foods		
Mother 3	• No iron supplements and low intake of iron-rich foods	• 250 millilitres Bomdwe and eggs • 250 millilitres of fish and katapa • 350 millilitres of impwa and eggs • Did not start taking iron supplements (feels lazy)
Mother 6	• No iron supplements	• Started taking iron supplements
Increase servings of fruits and vegetables		
Mother 7	• No vegetables	• 150 g of vegetables
Mother 9	• No fruits	• 4 bananas
Mother 10	• No fruits	• 2 bananas
Mother 17	• No vegetables	• 2 servings of 2 tablespoons of rape
Stop taking alcohol during pregnancy		
Mother 8	• Was taking alcohol during pregnancy	• Stopped taking alcohol
Stop overcooking vegetables		
Mother 18	• Overcooked vegetables	• Stopped overcooking vegetables

Examination of Recommendations and Results

The following were the common nutrition problems and associated recommendations amongst pregnant women:

- Eat required amounts of food at every meal,
- Eat the required number of meals by eating three main meals and adding at least two snacks daily, and
- Stop eating soil.

The most common recommendations for hygiene included

- Wash hands before handling food and after using the toilet,
- Boil or chlorinate drinking water or water used for cleaning feeding utensils,
- Store drinking water in narrow-mouthed containers, and
- Use clean water to wash hands every time you handle food and when eating and use running water, not collected water in a dish to wash hands before eating anything.

All of the mothers accepted all the recommendations. A majority of the mothers tried, liked, and adopted the practices. Those who tried said that they saw an improvement in their energy levels and their appetite. Almost all of the women said that they were encouraged to adhere to what was recommended by their partners and close neighbours and relatives.

All of the women who tried and who were eager to continue with the recommended practices said that they would pass on the information to their friends and relatives by citing the benefits of the practices and also by sharing their positive experiences with implementing the practices.

Some mothers accepted the recommendations but did not try them. These recommendations and reasons for lack of implementation included the following:

- **Stop eating soil.** None of the pregnant women who were in the habit of eating soil managed to kick the habit. While they weren't able to stop the habit, they did reduce the frequency and the quantity of soil they ate per day. "I had stopped eating soil; it's only yesterday that I ate some… the craving was too much…in the past 14 days, I think that I only had the soil about three times," said an 8-months pregnant woman in Mwase Lundazi rural. One woman mentioned that she ate sweet mints to distract herself from craving soil, and another woman said that her craving for soil reduced after she increased her intake of snacks such as oranges and bananas, as she usually felt too full to eat anything else.
- **Add or increase servings of fruits in daily diet.** One mother said that she could not afford to buy fruits. The recommendation about pregnant women's ability and willingness to grow their own foods, such as vegetables, was not necessarily given to any of the women. However, during the discussions, women mentioned that it was difficult for them to grow their own vegetables because of the distances to the water source; for some it was because of busy schedules, and others simply have never thought about it.

- **Boil or chlorinate water for drinking or cleaning feeding utensils.** Most of the mothers said that they did not treat their water because chlorine was not available or because they believed that their water was safe to drink. "I boil water when I draw it from the well, but when I draw from the kiosk I don't need to boil it because it is already chlorinated," said a pregnant woman in Mwase rural. Some said that they forgot to boil the water.

Summary

The following concludes the key findings based on the above analysis:

- **Maternal diet**. All of the pregnant women said that their diet did not normally change from their usual way of eating in terms of buying special foods for themselves. Rather, they buy enough food for the whole family. Most pregnant women generally eat insufficient food, and they normally have fewer meals than is ideal for pregnant women.
- **Hygiene**. Most pregnant women practised poor hygiene, including drinking unsafe water and not washing hands with soap before handling food.
- **Personal influencers.** Pregnant women most commonly received information about nutrition from health personnel, friends, mothers, and elderly community members. However, lack of local accessibility and affordability of foods, coupled with food cravings, deterred women from practising healthy nutritional behaviours.
- **Nutrition decision making.** Pregnant women played the key role in deciding what food to prepare for the day. Male partners merely play an advisory role and most importantly they provided the money to buy food. Affordability and availability of food, either in the community or household, determined whether pregnant women implemented the recommendations. The primary concern for the women was to buy food enough for the entire household and once this goal was achieved, then they women were able to buy some foods they considered special including chips and soft drinks.
- **Urban vs. rural**. Some reports varied in types of food easily available in urban and rural locations depending on seasons. The diets of rural mothers predominately consisted of vegetables. Problems with the accessibility of specific foods during different seasons proved to be most significant in rural areas.

Mothers of Children Aged 0–5 Months

The following is an analysis of interviews and observations of 17 mothers of children 0–5 months of age. Eleven mothers were in urban locations, and six mothers were in rural locations. Three of these mothers were not available for the third visit; therefore, the data on their responses to the recommendations for change in nutrition and hygiene behaviours are not included in this report.

Common Nutrition Behaviours

Breastfeeding

Based on self-reporting and observation, the majority of mothers participating in the study exclusively breastfed their children. All of the mothers reported feeding their children the "first milk." Their reasons for doing so included recommendations from clinic staff and the belief that the first milk would keep their children healthy, prevent illness, and foster brain growth. A mother from an urban location said, "Breast milk is the best compared to these other foods that we give the children, especially when the food is not well prepared and can make the child have diarrhoea. Breast milk can't do that. So I prefer that I breastfeed her for as long as she wants, so that I will not have any problems with her because other foods may even cause the child to be sick." Table 4 shows the ages of the children at the time of the interview and whether they were exclusively breastfed or supplemented with other foods.

Table 4: Ages of Children and Source of Nutrition

Age of Child	Source of Nutrition
5 days	Breast milk
1 month	Breast milk
1 month	Cow's milk
2 months (3 children)	Breast milk
3 months (4 children)	Breast milk
4 months (3 children)	Breast milk
4 months	Breast milk and porridge
4 months	Breast milk, Super Shake Maheu, and cooking oil
5 months (2 children)	Breast milk and porridge

The breastfeeding practices within a 24-hour period varied amongst the nursing mothers. The frequency of breastfeeding sessions for all nursing mothers ranged from 6 to 18 times a day, with an average of 11 sessions per day. The length of the sessions for all nursing mothers ranged from 5 to 30 minutes, with an average of 10 minutes per session. For mothers not exclusively breastfeeding their children, the frequency of sessions ranged from 6 to 14 sessions, with an average of 10 sessions per day. Their length of sessions ranged from 5 to 15 minutes, with an average of 9 minutes per session. Most of the mothers used both breasts during each session, but only a few appeared to empty their breasts of milk. About half of the women exhibited poor positioning when breastfeeding, including the use of the scissor hold, lack of closeness between mother and child, and poor attachment. Mothers who exhibited poor breastfeeding behaviours appeared to be less knowledgeable of the ideal breastfeeding practices. Several mothers reported learning from the health clinics to breastfeed as often as possible and to ensure proper positioning, but many mothers breastfed less frequently in short sessions using poor

positioning. Many women also were not aware of the need to use and empty both breasts during each session.

Most of the mothers breastfed their children on demand in response to their children's signs of hunger, such as crying or sucking of the tongue, or if their breasts were very full or it had been several hours since the last feeding. "When she starts crying, I breastfeed, and when it has been long time from [last feeding] I breastfed. There are some babies who don't cry, they just sleep, but for my baby I wake her up and breastfeed her," said an urban mother. Only a few of the women reported breastfeeding their children on a fixed schedule, because their children slept a lot and needed to be awoken to feed or their work or household chores made a fixed schedule necessary.

In the interviews, mothers also offered their plans for breastfeeding in the future. Their plans for the cessation of breastfeeding ranged from 6 to 24 months, with an average of 19 months. Several mothers planned to breastfeed for 2 years because clinical staff told them that was best for their children. "When he is 2 years, that's when I will stop because that's what we are taught at the clinic," said an urban mother. Mothers who wanted to breastfeed for a longer time explained that it was to keep their children healthy in case food becomes scarce, to help with family planning, and to allow the mothers to travel and be able to feed their child no matter the availability of food. "I think like that is because the body, how can I put it, it is an encouragement for us to space the children. The other reason, sometimes, I am moving from one place to another, so like I have a small baby maybe at that time I would have no water, that would cause me to breastfeed her so that she does not get thirsty and also the food that I give should work hand in hand with the milk," said a rural mother. Other women who planned to breastfeed for a shorter time explained that it would allow them to attend to their other responsibilities, such as schooling for themselves. One woman planned to stop breastfeeding at 6 months due to being HIV positive and being told by the clinic that HIV could be passed through the milk after 6 months.

Replacement or Complementary Feeding

Mothers who were not exclusively breastfeeding most commonly supplemented with watery porridge. The amount and frequency of the provision of porridge ranged from 1 to 3 tablespoons once to three times a day. Most of these mothers reported first giving their children porridge at around 4 months of age because they believed that their children were still hungry and that the breast milk was insufficient due to an increase in crying. "I discovered that he was overbreastfeeding, and so I thought breast milk alone was not enough; so I decided to introduce him to porridge just to make him reduce on breastfeeding," said a rural mother. A couple of mothers reported giving their children the Maheu Super Shake (nonalcoholic maize drink) up to twice a day. One mother started giving her child Maheu at 5 months because she believed that her breast milk was insufficient, and another mother started giving the drink at 5 days to help nourish her child, who was ill. Another mother reported giving water after each feeding of porridge at age 4 months. One child received fruit juice twice a day starting at 4 months, while another child received cooking oil when the mother believed the child was exhibiting stomach pains. In most cases, the mothers fed their children Complementary foods. In one case, observation data showed that other adults, including the mother's sister and mother-in-law, also helped with the feeding.

A couple of mothers made the decision to supplement their children's diet and choice of supplement based on the reaction of their children when fed. "I first gave her Super Shake, she drunk; then I gave her again; she then spit it and I stopped; by then she was 5 months old. Then I tried the porridge, but she also had at first refused because it had sugar, but when I prepared the one with salt, she eat, so I now prepare one with salt and I add a bit of butter or some cooking oil if there is no butter," said an urban mother. Another urban mother said, "I stopped because it's like he never liked the S-26, so this time now I introduced him to cow milk, at least he is getting along with it."

One mother reported completely stopping breastfeeding when her child was 2 days old. "I stopped because of work, am not always at home, am a field worker, so I looked at the way I will be moving. Sometimes if we go in the bush, we spend 1 week there; I can't be going with him, and he is too small," said an urban mother. The mother needed to travel to work in the field for an extended period of time and couldn't bring her child. She started her child on S6 formula but found that the child would not drink it. The mother switched from formula to pasteurised cow's milk at 2 months because she saw other children in her village grow well when on cow's milk. She currently feeds her child approximately eight 750 ml bottles a day. The baby bottles are boiled each time for cleaning.

All of the mothers, including those exclusively breastfeeding, were asked about their plans for the future introduction of new foods and liquids. Mothers most commonly reported planning to feed their children watery porridge at 6 months. "I am sure he would have started demanding for more breast milk and I might not be able to meet that demand. Also his intestines would be well developed then to handle food and liquids," said an urban mother. Several mothers also planned to give their children water at 6 months. Other mothers planned to feed their children porridge at 4 months, nshima at 8 months, and groundnut at 6 months. A few mothers planned to give liquids, including Maheu drink or juice, at 6 months. One reason for these plans was the belief that these foods were healthy options for their children and would need to be added to their diets when breast milk became insufficient. A few mothers also indicated that these are the foods that are commonly given to children by other mothers in their village.

Maternal Diet

For the most part, the diets of nursing mothers did not differ from the rest of the family. A rural mother said, "There is no difference. We tend to eat anything that comes which is available." According to the dietary recalls, the mothers and their families ate a range of different foods. Common foods included nshima, kapenta, rape, beans, groundnuts, eggs, oranges, bananas, chicken, beef, and pumpkin leaves. Observation and interview data showed that about half of the households grew their own food. Foods commonly grown in home gardens included onions, groundnuts, maize, spinach, rape, and sweet potato leaves. A few women demonstrated a lack of awareness in the nutritional value of traditional and locally available foods. "They (mabuyu/kawawasha or busika) are actually cheaper. I am just surprised that traditional fruits are better than the juices like mazoe or ice blocks I buy…I am surprised that cow peas being a source of protein, and can't wait to start trying the practice because am impressed with the idea," said an urban mother.

Only a few of the mothers believed that they should change their diets when nursing. Some women mentioned that nursing mothers should eat more fruits and vegetables, nshima with cassava flour, and cow's milk to help produce more breast milk. A couple of mothers also mentioned that nursing mothers should not consume alcohol or Chinese cabbage. In the second visit, about a quarter of the women were asked to change their diets to include more fruits, vegetables, protein, and liquids. See the section on the dietary recall and recommendations for more details.

Hygiene and Illness

Of the five mothers not exclusively breastfeeding, most reported that their children have been sick since birth. Illnesses included the flu, coughing, and sneezing. None reported episodes of diarrhoea. Most of these mothers used unsafe water that was drawn from a well or borehole and not treated or stored in a covered or narrow-mouthed vessel. Several of these mothers were unaware of the need to treat their water because they believed their water was previously treated with chlorine by local water authorities or that their water source needed no treatment at all. "We were not aware that you need to boil or chlorinate some water. Others say that for the water drawn from a well is the one to be boiled or chlorinated and that which is drawn from a borehole is very clean and there is no need to chlorinate it," said a rural mother. Only a couple of mothers reported boiling their water, and one mother reported chlorinating her water. Most of the mothers did not cover their food, and most homes had flies. In preparing the porridge, only one mother brought the water to a boil for mixing with the grain. Half of these mothers washed their hands with soap before preparing the food, while the others either did not wash their hands or did not use soap. The majority of all of the mothers also did not wash their hands with soap before breastfeeding. A few washed their hands with soap, while the rest either did not wash their hands at all or did not use soap. Some mothers washed their hands using water that had already been used to wash hands.

The majority of mothers explained that they would not change their children's diet or schedule when they were ill. "Like this time when he has stomach problems, I don't do anything because I hear all babies experience that until they are 3 months or so…there is really nothing much I do," said an urban mother. Some mothers said that they would try to breastfed their children more to ensure that they were hydrated and to help fight the illness. A few mothers said that they would feed their children less due to a decreased appetite and an increase in sleeping. "When she is sick, I don't regularly breastfeed her because she is not feeling well. I try to breastfeed her, but she refuses," said a rural mother. One mother reported that she would force-feed her child to eat, despite lack of appetite.

Underlying Factors

Personal Influencers and Common Beliefs

Mothers appeared to be influenced by several different sources on breastfeeding and general nutrition for their children. They most commonly mentioned relying on staff at the health clinics for information on nutrition. "I trust what I learn from the clinic most," said one urban mother. Several of these mothers specifically mentioned speaking with staff about nutrition during their ANC visits. Mothers also commonly relied upon their mothers and friends for advice. "She was crying, so I was advised by my parents that maybe you start giving porridge. They said it's because she is hungry, so it's better if you

start giving her porridge, that's how I started," said a rural mother. Other influencers included their grandmothers, sisters, and the Neighbourhood Health Committee. The vast majority of mothers did not know about any events or opportunities for group learning on nutrition.

These individuals and groups influenced mothers' beliefs and behaviours related to their children's nutrition. For example, many of the mothers illustrated a strong belief that breast milk, particularly the first milk, was the best source of nutrition for their children because it helped prevent illness and develop the brain. "When I used to attend antenatal, they were teaching us that the milk is important. The first milk is important for the baby because they don't usually fall sick. That is what they told us, yah. Then it's also good for the brain," said one rural mother.

A couple of women also believed that giving cow's milk before 1 year of age would cause allergies in their child. Many of the mothers believed that the intestines of children under 6 months of age are too weak to digest solid foods such as porridge and, in turn, plan to wait to offer solids until 6 months. "The intestines are still small and tender. It can be hard for the baby to go to the toilet and that can make him have severe stomach upsets. So we are avoiding solid foods because of that, not until such a time when they will be capable enough to hold solid food," said a rural mother. However, as illustrated above, some of the mothers believed that an increase in crying indicated a need to supplement children's diets with other foods before 6 months.

Several of the mothers also seemed to be influenced by their observations of how other mothers feed their children. In justifying the provision of cow's milk rather than breast milk or formula, an urban mother said, "I have seen a lot of people use cow milk and they grow well." In a similar case, another urban mother explained seeing other mothers feed their infants Super Shake Maheu: "I was just trying and sometimes I see people at the clinic giving their babies, so I also thought I could give my baby; I can't say that it was the nurse who told us. No, I just decided on my own. So I just wanted to try it on my own." A quarter of the mothers also demonstrated applying their experiences with their older children to decisions on caring for their infants. An urban mother said, "That [porridge] is what I have been giving all his siblings, and I have discovered that truly these have no problems at all and are very good to babies and for Maheu drink, I find that it is readily available even when am away from home or on a journey, I can just buy and feed the baby."

Another influencing factor in nutrition behaviours appeared to be the responsibility of attending to household chores, income-generating activities, and school. Most of the mothers did not practise ideal behaviours by ending feeding sessions too early, not breastfeeding at all, and not properly treating water at least partially due to other responsibilities. "Yesterday, I starved him, I did not breastfeed enough; I was busy washing. So, I can't say I was busy with breastfeeding, and my husband was annoyed with me. He had to stop me from washing around 15:00hrs because I starved him, to tell the truth," said an urban mother. Another urban mother said, "I have seen that they are behind in knowledge because when they are going to do their piece work, they just leave their child without feeding, so I have seen what I have learned is good."

Mothers most commonly equated the health and growth of their children to the frequency and severity of and recovery from illnesses contracted by their children. They believed that their children were healthy if they were not getting sick often (e.g., once a month) or suffering from serious illnesses such as malaria. Some women associated child health and growth with weight gain, developmental milestones (e.g., sitting up), and happy demeanour. Mothers seemed to believe that they had control over their children's well-being, and only one mother demonstrated a sense of fatalism due to limited resources.

Mothers also described their beliefs about the cause of diarrhoea in young children. Although mothers most commonly believed that diarrhoea is caused by mothers not cleaning their hands or their children's hands before preparing food or feeding, several other mothers believed that diarrhoea is caused by teething. Other causation beliefs included unclean breasts, food, household surfaces, and cooking and eating utensils. A couple of mothers thought that diarrhoea was caused by giving water or porridge to children under 6 months.

Food Availability

For the most part, mothers seemed to have enough food for themselves and their families year-round, particularly in urban locations. Although mothers in both rural and urban locations reported a reduction in locally available food (e.g., rape and kapenta) during the rainy season, mothers in rural locations seemed to feel a greater impact without being able to purchase other foods available in urban markets. "Yes, they [foods during shortage] are available, but only the money to use may be difficult to find," said an urban mother. Many women implemented strategies to address food shortages. Strategies included saving money to buy more foods from the markets and eating foods still locally available (e.g., cabbage). A couple of mothers also reported using timetables and lists to help the family manage their diets while staying on a budget. "My husband gave me an idea, like what are we supposed to do, here where we live is a village, it is not like town where we came from, so we need to sit down and make a budget," said a rural mother. For the several women who were not able to use these strategies, food portions were reduced for all family members, and some found extra work to afford buying foods from nearby villages. "We share small portions of food," said an urban mother.

The vast majority of the mothers served as the primary decision makers on the types of foods grown, bought, and cooked. Only a few of the mothers reported that their mothers, in-laws, or husbands made the decisions on food preparation. The vast majority of mothers also illustrated that their husbands strongly supported healthy nutrition for the mother and children by providing money to purchase foods and at times by purchasing and preparing foods upon request of the mother. "Sometimes he buys food and sometimes he gives me money to buy what I want or what I feel like eating…he sometimes makes food like for the baby when am not feeling well, yah, or when am busy he helps me to prepare food for the baby and me also," said a rural mother. Only a couple of mothers reported that their husbands did not provide any type of support. Other factors that influenced the decision on the types of foods mothers prepared for the family included the availability of funds to purchase foods, the ability to grow the foods in the household garden, and the desires of the family for a variety in foods. "It depends on what food is there in the house that day. Whatever is there is what we eat, especially in times when I don't have enough money to buy what I would want to eat," said an urban mother.

Recommendations and Results for Change in Nutrition Behaviours

Table 5 illustrates the recommendations made for change in nutrition and hygiene-related behaviours and participants' responses to these recommendations.

Table 5: Recommendations and Results for Mothers of Children Aged 0–5 Months

Recommendations	Offered	Accepted	Tried	Liked	Adopted
Child Nutrition					
Start breastfeeding again					
• Urban	1	0	0	0	0
• Rural	0	0	0	0	0
Improve positioning for breastfeeding					
• Urban	8	8	7*	7*	7*
• Rural	5	5	3^	3^	3^
Stop giving Complementary foods (e.g., porridge, Maheu) to the child					
• Urban	2	2	2	2	2
• Rural	3	3	2*	2*	2*
Increase the daily number of breastfeeds					
• Urban	3	3	3	3	3
• Rural	2	2	2	2	2
Use and empty each breast at each session					
• Urban	7	7	6*	6*	6*
• Rural	5	5	3^	3^	3^
Increase the length of breastfeeds					
• Urban	6	6	5*	5*	5*
• Rural	3	3	2*	2*	2*
Stop giving water to the child					
• Urban	1	1	0	0	0
• Rural	1	1	1	1	1
Maternal Diet					
Increase servings of fruits and vegetables					
• Urban	4	4	1*	1*	1*
• Rural	2	1	1	1	1
Increase servings of protein					
• Urban	2	2	1	1	1
• Rural	0	0	0	0	0
Increase the number of daily meals or snacks					
• Urban	1	1	0*	0*	0*
• Rural	1	1	0	0	0
Increase liquids					
• Urban	0	0	0	0	0
• Rural	1	1	0*	0*	0*
Hygiene					
Wash hands before feeding the child					

Recommendations	Offered	Accepted	Tried	Liked	Adopted
Child Nutrition					
and after using the toilet • Urban • Rural	 6 1	 6 1	 5* 0	 5* 0	 5* 0
Boil or chlorinate water for drinking or for cleaning dishes • Urban • Rural	 4 2	 4 2	 3 0*	 3 0*	 3 0*
Clean inside home with soap • Urban • Rural	 2 1	 2 1	 2 0*	 2 0*	 2 0*
Wash the toilet with soap • Urban • Rural	 3 1	 3 1	 3 1	 3 1	 3 1
Store drinking water in closed or narrow-mouthed container • Urban • Rural	 1 2	 1 2	 0 1*	 0 1*	 0 1*

*This recommendation was given to one participant who was not available for the third visit to assess the implementation of the recommendations and whose responses are not included in this number.

^This recommendation was given to two participants who were not available for the third visit to assess the implementation of the recommendations and whose responses are not included in this number.

Specific Changes in Maternal Diet

Table 6 outlines the details in the changes mothers were able to make in their diets based on their dietary recalls. As illustrated in Table 3 above, only three mothers implemented the recommendations.

Table 6: Specific Changes in Maternal Diet

Recommendation	First Visit Total Daily Recall	Third Visit Total Daily Recall
Increase servings of fruits and vegetables • Mother 1	• Rape and mushrooms (750 grams) • Cabbage (500 grams)	• Rape (500 grams) • Cabbage (500 grams) • Cowpea leaves (500 grams) • Beans and groundnuts (500 grams) • Pumpkin leaves (200 grams)
• Mother 2	• Rape (3 tablespoons) • Soya pieces (2 tablespoons)	• Rape (6 tablespoons) • Soya pieces (3 tablespoons) • Cabbage (3 tablespoons) • Bananas (2)
Increase servings of protein • Mother 1	• Beans (2 tablespoons)	• Chicken (4 pieces) • Minced meat and beans (4 tablespoons)

Examination of Recommendations and Results

The most common recommendations for child nutrition included

- Improve positioning for breastfeeding,
- Use and empty both breasts, and
- Increase length of breastfeeds.

The most common recommendation for maternal nutrition was

- Increase servings of fruits and vegetables.

The most common recommendations for hygiene included

- Wash hands before feeding the child and after using the toilet, and
- Boil or chlorinate water for drinking or for cleaning dishes.

The vast majority of mothers accepted, tried, liked, and adopted the practices. The vast majority of the mothers who tried the practices did not modify the instructions provided by the researchers. Many said that they could see positive changes in how their children were feeling and increases in their breast milk supply. Most of their families were very supportive, and the mothers said that they would recommend these practices to friends, neighbours, and family members. Mothers committed to continuing the practices mostly because they believed that their children will grow better, their milk supply will increase, and they will be able to prevent diseases. "What will make me continue to wash my hands when breastfeeding is to prevent my child from getting diseases," said an urban mother. Another urban mother said, "I have seen nice things out of this because there is an improvement in my milk production. I used to think, I do not have enough milk. Now that I often breastfeed, I have seen that the milk comes out."

Mothers most commonly planned to recommend the practices by explaining to others that the practices would prevent disease and support the health and growth of their children. "I will explain to her what causes diarrhoea in babies, and one of them is mother not washing hands with soap," an urban mother said. Many mothers also planned to share their own positive experiences with the new practices, demonstrate the new practices, and check in on the households to see if they were implementing the new practices. "I tell to them on what I was taught, and show them how to do it," said an urban mother. Another urban mother said, "I will share my experience with them about how I used to use one breast on feeding and how it started appearing smaller than the other breast. And I will share to them what I have learnt and how my baby sucks from both breasts and that he is always satisfied and he cries less."

Only two mothers did not accept a recommendation. One mother would not begin breastfeeding after stopping for a couple of weeks out of fear that her breast milk had soured and would cause her child to get ill and die. "I asked my neighbours—she told me I shouldn't try it. She has seen a lot of people die of the same, so I was scared to lose my child because it has happened to too many people," an urban mother said. Another woman said that she would not be able to afford to buy more fruits and vegetables to add to her diet.

Some mothers had accepted the recommendations but did not try them. These recommendations and the reasons for lack of implementation included the following:

- **Stop giving water to the child.** The researcher observed the mother giving her child water after breastfeeding, but did not question the participant on the reasons for not implementing the recommendation.
- **Increase servings of fruits and vegetables.** These mothers reported that they were not able to afford or grow enough fruits and vegetables to meet the requirement.
- **Increase servings of protein.** One mother was not able to afford or grow additional sources of protein.
- **Increase the number of daily meals or snacks.** One mother added one, but not two snacks.
- **Boil or chlorinate water for drinking or for cleaning dishes.** One mother did not chlorinate her water for washing dishes because she did not have any chlorine.

Summary

The following concludes the key findings based on the above analysis:

- **Breastfeeding**. The majority of mothers are exclusively breastfeeding, with an average of 11 sessions per day based on the demand of the child. On average, mothers plan to breastfeed for 19 months. However, overall, mothers need to increase the length of each session, use and empty both breasts, and improve their positioning. Many mothers seemed unaware of the proper breastfeeding practices.
- **Replacement or Complementary feeding**. Only a few mothers are replacing or supplementing breast milk with other foods or liquids—most commonly watery porridge. Most mothers plan to wait to give their children watery porridge until age 6 months.
- **Maternal diet**. Mothers do not adjust their diets for breastfeeding. A few of the mothers demonstrated a lack of fruits, vegetables, and proteins in their diets, as well as an overall insufficiency in the number of meals and snacks.
- **Hygiene and illness**. Many mothers also demonstrated poor hygiene by not washing their hands with soap before feeding their children. Some mothers failed to properly treat water for drinking or clean dishes in some homes despite recommendations to do so. Many mothers believed that their water sources had previously been chlorinated. Most mothers do not plan to adjust their children's nutrition when they fall ill.
- **Personal influencers and common beliefs**. The beliefs and behaviours of mothers appear to be influenced by a range of other individuals, but most commonly by the health clinic staff. Many mothers believe that breast milk is the best nutritional option for their children. Mothers also seem to be influenced from observing other mothers and their personal experiences caring for children. And, although many mothers believe that diarrhoea is caused by unclean hands, some still believe that it is primarily caused by teething. Household chores, income-generating

activities, and attending school also deter some mothers from practising healthy nutrition behaviours.

- **Food availability**. Overall, mothers played the most significant role in deciding on the food prepared for the family, with strong support from their husbands. However, food availability, particularly some fruits and vegetables, appears to have a notable influence on the ability of mothers to implement recommendations.
- **Urban vs. rural**. Mothers in urban and rural locations faced similar challenges in dealing with food shortages, but rural mothers seemed to feel a greater impact without access to foods available in urban markets. Rural and urban mothers exhibited similar nutrition behaviours, with the exception of a higher rate of rural mothers supplementing their children's diets and not safely storing water for drinking.

Mothers of Children Aged 6–8 Months

The following is an analysis of the interviews and observations of 19 mothers of children 6–8 months of age. Ten mothers were from urban locations, while nine were from rural locations. One of these mothers was not available for the second and third visits; therefore, the data on recommendations for change in nutrition and hygiene behaviour and her responses are not included in this report.

Common Nutrition Behaviours

Breastfeeding

All of the mothers were still breastfeeding their children at the time of the interview and trial. The breastfeeding practices varied amongst the mothers. The frequency of breastfeeding sessions for the mothers ranged from 5 to 13 times a day, with an average of nine sessions per day. The length of the sessions for the mothers ranged from 3 to 25 minutes, with an average of 10 minutes per session. Slightly more than a quarter of the mothers used only one breast during each session and didn't appear to empty their breasts of milk. Only a few of the women exhibited poor positioning when breastfeeding, including the use of the scissor hold and poor attachment.

Slightly more than half of the mothers breastfed their children on demand in response to their children's signs of hunger, such as crying, or if their breasts were very full or it had been several hours since the last feeding. "When she wants to suckle, I give her, then other times I look at the last time she suckled then I give her even when she has not cried," said a rural mother. The rest of the mothers reported scheduling feedings around their fixed schedule for feeding other liquids and solids.

In the interviews, mothers also offered their plans for breastfeeding in the future. Their plans for the cessation of breastfeeding ranged from 12 to 24 months, with an average of 20 months. Several mothers planned to breastfeed for 2 years, because clinic staff told them that was best for their children. Several of the mothers also planned to breastfeed for around 18 months, when they expect their children will be walking. "You cannot stop breastfeeding the baby when he is only 1 year, but 2 years the baby is able to walk strongly; that's when he can stop sucking," said an urban mother. Some of these mothers also said that they wanted to breastfeed long enough to keep their children healthy, but not too long to prevent them from eating more solid foods.

Replacement or Complementary Feeding

All but one of these mothers were supplementing their children's diet. One mother was giving her child water, but not any solids. Most mothers reported that their children's first foods and liquids other than breast milk were water and light porridge made from either mealie meal or cassava, and was given at 6 months. Several women specifically mentioned deciding on when and how to supplement their children's diets based on advice from health centre staff. "We are taught at the clinic that a child should only start eating porridge at 6 months. This was the reason that I started giving her porridge and water when she turned 6 months," said a rural mother. Several women also mentioned adding groundnuts to the first servings of porridge. Other first foods included Parmalt milk, nshima, egg, bean soup, juice, and Chibwantu. Some women gave their children Complementary foods before age 6 months, including at ages 5, 4, 3, and 1 month. Reasons for early supplementation included the belief that children were

hungry and not getting enough breast milk, pressure from a mother-in-law, and belief that children were displaying interest in the foods. "They [the mother's parents] started telling me when the baby was only 2 months old that I should give him porridge. But I refused. I told them that I will give him at 6 months. But due to the (pressure subjected on me), I gave in at 5 months and I introduced him to porridge," said an urban mother.

Common foods given to children included thick porridge with groundnuts, nshima, kapenta soup, bean soup, potatoes, and fish. Mothers most commonly boiled the meals for the children. The majority of mothers reported giving their children three solid meals, including snacks, per day. Others reported giving two, four, and five meals per day. The vast majority of women followed a fixed schedule for giving their children meals at the same time that they fed the rest of the family. The quantity of each meal varied, but several mothers were not providing meals of at least 250 millilitres. Many children did not have a diet that included solid fruits, vegetables, and proteins, but rather the water from cooking those foods. Several mothers indicated that they were unaware that fruits, vegetables, and proteins could be mashed and served to their children. "I didn't know that vegetables can be mashed and then added to baby's food or porridge and also mashing meat or beans and adding it to baby's food," said an urban mother. Another urban mother said, "Because she doesn't have teeth, she can't chew. So, only when she has teeth is when you can give her meat to eat. For now we just give her the soup." Several women were also unaware of the nutritional value of traditional fruits. "Fruits like bananas, oranges, and apples, those are not found here unless in town, but the problem is money. We don't have [money], but when wild fruits are in season I will be eating it with my baby," said a rural mother.

Mothers' reasons for selecting the foods to feed their children varied. Mothers selected specific foods because they thought they were high in nutrients and offered a balanced diet. "When he was born, I said 'For my baby to be healthy, what can I do?' That's when I thought of pounding some groundnuts for him, add some salt to the porridge and feed him," said an urban mother. A quarter of the mothers based their decision on children's interest or lack of specific foods. "I do this [provide zigolo, a sugary drink] because sometimes he does not want to be breastfed. That's when I quickly think of cooking porridge for him. When he refuses to eat porridge, I try him with zigolo. Among those things at least, he gets to accept one," said an urban mother. Some mothers decided on what types of food based on advice from health centre staff and guidance on their under-5 clinic cards. "They [health centre staff] tell us the kind of food to feed a child and I also see the food that are written on the under-5 clinic cards what foods to feed the child," said a rural mother. A few mothers also made decisions about their children's diet based on the availability of foods. "What led me to pick porridge all else because porridge is good for children his age. Also, when it is porridge with groundnuts, I won't have the problem of running out of money like I had started him on something bought from a shop. So with this porridge, I have it when needed, we grow the maize and the groundnuts. So when you need it, you just get and cook," said a rural mother.

Mothers also had very different viewpoints and concerns about the foods not to feed their children. Some mothers were hesitant to give their children foods such as meat because their children couldn't chew and swallow it. Other mothers were concerned about giving vegetables, fruits, and juice because they believed these foods would cause diarrhoea. "The intestines are not strong enough to

accommodate such foods, so if the baby eats such foods she can fall sick," said a rural mother. A few women mentioned not giving their children buns or sugary drinks because they were not nutritious. Other women did not want to supplement their children's diet out of fear of not being able to afford doing so on a regular basis. "I didn't want him to get used to eating sugar, salt, or groundnuts in case we run out of money," said an urban mother. Most mothers determined when to end a feeding by taking cues from their children: when children appeared to be full and began spitting out their food or refusing to eat any more.

In most cases, children ate their meals with their family members. Most of the children shared plates either with their mother or their entire family and took water from a cup used by others, and in many cases, kept in the water container. Only a few of the mothers reported keeping separate spoons, feeding cups, and plates for their children aged 6–8 months. Most of the mothers fed their children with spoons and on occasion would use their hands when feeding them nshima. In a few cases, children fed themselves. In all but one case, no family member other than the mother was recorded feeding the children.

Almost half of the mothers reported doing some level of force-feeding for both sick and healthy children. "He doesn't eat. He cries a lot when I start feeding him. So I just try to force him, thinking that he may eat, but it fails," said an urban mother. Another mother from a rural location said, "If a child is sick and he is used to eating, if he is refusing to eat and doesn't eat, he will develop sores in his throat. So it is better that even if he is refusing, you cook some porridge and force him to eat, so that he just swallows, even if it is just a little. If a child is used to eating and he becomes sick, if he refuses to eat and you've gone to the clinic to get him medicine, how does he take his medication if he is not eating? You should force him to eat, so that that medicine finds food in his body."

Maternal Diet

For the most part, the diets of nursing mothers did not differ from the rest of the family. "There is no difference, we all eat the same food," said an urban mother. According to the dietary recalls, the mothers and their families ate a range of different foods. Common foods included nshima, kapenta, beans, soya pieces, fish, and rape. Observation and interview data showed that the majority of households maintained gardens and commonly grew chibwaba, beans, maize, and groundnuts. Several mothers believed that nursing mothers should eat more than the rest of the family and should have a balanced diet with vegetables and protein. "One who breastfeeds eats a lot to make baby's milk, but one who is not breastfeeding just eats a bit because she is alone or doesn't make milk," said a rural mother. One mother stressed the importance of including a large amount of liquids to ensure that mothers produce enough breast milk. A few women also mentioned that nursing mothers should not consume local okra because it would reduce the amount of breast milk.

Hygiene and Illness

All of the mothers reported that their children have been sick, on average, five times since birth. Most common illnesses included diarrhoea, cough, and flu. A quarter of the mothers mentioned that their children seemed to have a low appetite on a regular basis and either were not gaining or were losing weight. A few children had malaria, and one child was found to be malnourished at 2 months old. The

vast majority of mothers reported taking their children to the under-5 clinic once a month since birth. When asked about changes in the children's diet when ill, most mothers said that they give their children less food due to low appetite, and several reported trying to force-feed their children. Some mothers mentioned that they would try to give their children more liquids, including breast milk, to prevent dehydration. "I think that the breastfeeding needs to be frequent, so that lost [nutrients] can be replaced," said an urban mother.

Most of these mothers used unsafe water that was drawn from a well or borehole and was not treated or stored in a covered bucket. Common reasons for not treating water included the perception that boiling water took too much time and chlorine was too expensive. "We are not used with boiling because we feel that it can take us too much of our time. We are always in a hurry, which, if chlorine can be accessed, I think it can be an easy thing to do. If only it was bought at a cheaper price. At the moment, chlorine is expensive: it costs about 1,000—500 kwacha [K1,500]. If we look at our economic status, this amount looks little, but it's not. At the end of the day, you will find that it's quite a lot of money, and in the end we will just drink water from the tap or borehole [without treating it]," said an urban mother. For those using covered buckets, many included a cup that would be used by the family and visitors. Most households covered their food and prevented flies. The majority of mothers and children did not wash their hands with soap, while some women and children washed their hands without soap. Several mothers also used water previously used to wash another's hands. Although several mothers highlighted the importance of cleaning their hands and cooking utensils when preparing their children's food, many of these mothers did not use soap when washing.

Underlying Factors

Personal Influencers and Common Beliefs

Mothers appeared to be influenced by several different sources on breastfeeding and general nutrition for their children. They most commonly mentioned relying on staff at the health clinics to provide information, most commonly during the under-5 visits. "I trust the health workers' advice the most on the issue of introducing foods or porridge to the baby at 6 months," said an urban mother. Mothers also often relied upon their parents, friends, and community elders for advice. "My in-law who stays in Nakonde called me and said because I am breastfeeding, I should not be eating too much of rape, but I should be having a lot of cabbage and other types of vegetables," said an urban mother. Most mothers did not know of any events or opportunities for group learning on nutrition. Some mothers mentioned attending events held by their Neighbourhood Health Committee, local health centre, or church. One urban mother explained, "We are taught that when we get the pumpkin leaves and cook, we feed our children, same as rape, we are advised to give our children because they energy, they energy giving foods."

A quarter of the mothers demonstrated making nutrition decisions based on their past experiences caring for their older children. "I usually stop breastfeeding most my children at 1 year 6 months, and they trouble me by crying a lot. That's the reason why I have decided to stop breastfeeding at 1 year 8 months with this one," said an urban mother.

The above-referenced individuals and groups influenced mothers' beliefs and behaviours related to their children's nutrition. Several mothers illustrated the belief that children need to drink water after eating solid foods to help the food travel to the stomach and to clean out their mouths. Others believed that an increase in liquids and multivitamins would help treat illnesses such as diarrhoea and flu. A couple of women also believed that some foods, such as sweet potato, would delay teething.

Mothers most commonly equated the health and growth of their children to the frequency and severity of and recovery from illnesses contracted by their children. They believed that their children were healthy if they were not getting sick often or suffering from serious illnesses such as malaria. Some women associated child health and growth with weight gain, activity level, and appetite. An urban mother said, "I learnt that if a child is not well fed, it will start swelling and will not look healthy. The child will also become thin." Most mothers seemed to believe that they had control over their children's well-being, but a quarter of the women displayed a sense of fatalism in the discussion of disease prevention. Some participants expressed that their efforts to prevent illnesses such as diarrhoea or flu were futile because of the many opportunities for infection and an underlying belief that these illnesses are a part of child development.

Mothers also described their beliefs on the cause of diarrhoea in young children. Most mothers believed that diarrhoea was caused by teething, and several other mothers believed that unclean water was a cause. "Teething causes the child to get diarrhoea," said a rural mother. Other causation beliefs included unclean hands, food, and cooking utensils. A few women thought diarrhoea was caused by fertiliser used in growing vegetables, soured breast milk, and too much time spent in the sun.

Similar to mothers of children aged 0 to 5 months, the nutrition behaviours of mothers of children aged 6 to 8 months were also influenced by the need to tend to household chores and other responsibilities. An urban mother commented, "I think that, when am done with house chores, I need to sit down and take out some time to breastfeed him."

Food Availability

Most of the mothers acknowledged a significant reduction in locally available food during the rainy season. Several of them implemented strategies to address this issue, including saving money to buy more foods from the markets, eating foods still locally available, and drying foods to save for the rainy season. "We normally keep some [food] for rain season, we dry in advance. So I will be going to the farm to dry in advance. Mostly when you grow, you start waiting for harvest," said a rural mother. The majority of women reported reducing food portions and the number of meals for all family members in both rural and urban locations. An urban mother said, "We sometimes miss meals, especially lunch, and for every meal we have to eat in smaller amounts." Urban mothers seemed less affected by food shortages compared to rural mothers unable to access foods available in urban locations. Mothers in both locations noted an increase in the price of foods during a time of shortage. "Because people have no money and there is nowhere to buy from, most people store their produce for consumption to see them through to the next harvest time. As we approach rain, they stop selling these foods. Since during that time, the money is also difficult to come by, so for you to buy enough food for the family it's a challenge. You have less foods," said an urban mother.

The vast majority of the mothers served as the primary decision makers on the types of foods grown, bought, and cooked. Only a few of the mothers reported that their husbands and mothers-in-law made the decisions on food preparation. The vast majority of the mothers also illustrated that their husbands strongly supported healthy nutrition for the mother and children by providing money to purchase foods and by purchasing foods upon the request of the mother. "He [husband] normally buys me foods like milk when he has money, but if has no money, we just eat what is available," said a rural mother. A few of the mothers also reported that their husbands encouraged them to eat healthy foods to help produce breast milk. Other factors in the decision about the types of foods to prepare for the family included the availability of funds to purchase foods, the ability to grow these foods in the household garden, and the desires of the family for a variety of foods. "I choose something that I know that I have in the house, or if I have money I go to buy and cook," said an urban mother. Another mother from a rural location said, "It all depends on how often we have eaten the same type of food. For example, if we continuously eat fish, then we change to vegetables mixed with groundnuts."

Recommendations and Results for Change in Nutrition Behaviours

Table 7 illustrates the recommendations made for change in nutrition and hygiene-related behaviours and the participants' responses to these recommendations.

Table 7: Recommendations and Results for Mothers of Children Aged 6–8 Months

Recommendations	Offered	Accepted	Tried	Liked	Adopted
Child Nutrition					
Start giving solid foods					
• Urban	0	0	0	0	0
• Rural	1	1	1	1	1
Increase the number of breastfeeds					
• Urban	1	1	0	0	0
• Rural	0	0	0	0	0
Use and empty each breast at each session					
• Urban	5	5	5	5	5
• Rural	3	3	3	3	3
Increase the length of breastfeeds					
• Urban	6	6	6	6	6
• Rural	4	4	4	4	4
Increase the number of meals and/or snacks					
• Urban	1	1	1	1	1
• Rural	3	3	2	2	2
Increase servings of mashed protein					
• Urban	7	7	3	3	3
• Rural	2	2	1	1	1
Increase servings of mashed fruits and vegetables					
• Urban	6	6	2	2	2
• Rural	4	3	2	2	2
Serve food on a separate plate or bowl					

• Urban	3	3	3	3	3
• Rural	3	3	3	3	3
Recommendations	**Offered**	**Accepted**	**Tried**	**Liked**	**Adopted**
Thicken the porridge by including groundnuts					
• Urban	4	4	3	3	3
• Rural	2	2	2	2	2
Stop giving sugary, non-nutritious drinks					
• Urban	2	2	1	1	1
• Rural	2	2	2	2	2
Stop force-feeding					
• Urban	1	1	1	1	1
• Rural	0	0	0	0	0
Increase the amount of solids to at least 250 millilitres each meal					
• Urban	3	3	0	0	0
• Rural	2	2	2	2	2
Hygiene					
Wash hands with soap before feeding the child and after using the toilet					
• Urban	4	4	3	3	3
• Rural	2	2	2	2	2
Boil or chlorinate water for drinking or for cleaning dishes					
• Urban	5	5	4	4	4
• Rural	2	2	2	2	2
Store drinking water in a closed or narrow-mouthed container					
• Urban	2	2	1	1	1
• Rural	0	0	0	0	0
Store food in covered containers					
• Urban	1	1	1	1	1
• Rural	0	0	0	0	0

Specific Changes in Maternal Diet

Table 8 outlines the details in the changes that mothers were able to make in their children's diets based on their dietary recalls.

Table 8: Specific Changes in Child Diet

Recommendation	First Visit Total Daily Recall	Third Visit Total Daily Recall
Start giving solid foods		
• Mother 1	• No solids	• Nshima with meat broth (1/4 lump) • Porridge with groundnuts (325 millilitres) • Nshima with bean broth (1/4 lump)
Increase the number of meals and/or snacks		
• Mother 1	• 4 meals	• 5 meals

• Mother 2	• 3 meals	• 4 meals
• Mother 3	• 3 meals	• 5 meals
Recommendation	**First Visit Total Daily Recall**	**Third Visit Total Daily Recall**
Increase servings of mashed protein • Mother 1	• No protein sources	• Nshima with fish and kapenta (1/2 plate)
• Mother 2	• No protein sources	• Nshima with beans (200 grams) • Nshima with fish (100 grams)
• Mother 3	• Nshima with fish and rape cooking water (125 grams) • Nshima with bean and rape cooking water (125 grams)	• Nshima, cassava leaves, and fish (100 millilitres) • Nshima and fish (225 millilitres)
• Mother 4	• Nshima, cassava leaves, and fish cooking water (300 grams)	• Nshima, rape, and fish (500 grams)
Increase servings of mashed fruits and vegetables • Mother 1	• No fruits or vegetables	• Banana (1)
• Mother 2	• No fruits or vegetables	• Nshima, rape, and kapenta (2 teaspoons)
• Mother 3	• Banana (1) • Nshima and rape (no recorded amount)	• Nshima and chibwaba (2 tablespoons and 1 lump) • Banana (1) • Nshima and rape (3 tablespoons)
• Mother 4	• No fruits or vegetables	• Nshima and rape (700 millilitres)
Increase the amount of solids to at least 250 millilitres each meal* • Mother 1	• Nshima (100 millilitres) • Nshima (100 millilitres) • Porridge (100 millilitres)	• Nshima and beans (750 millilitres) • Nshima and fish (500 millilitres) • Nshima and fish (500 millilitres)

*The transcript of one of the participants did not include a 24-hour dietary recall before the trial.

Examination of Recommendations and Results

The most common recommendations for child nutrition included

- Use and empty both breasts,
- Increase length of breastfeeds,
- Increase servings of mashed protein, and
- Increase servings of mashed fruits and vegetables.

The most common recommendations for hygiene included

- Wash hands before feeding the child and after using the toilet, and
- Boil or chlorinate water for drinking or for cleaning dishes.

The majority of mothers accepted, tried, liked, and adopted the practices. The vast majority of the mothers who tried the new practices followed the instructions provided by the researchers. Many said they would continue the practices because they could see increases in their breast milk supply, their children's appetite, and their children's activity level. Most of their families were very supportive. Mothers planned to recommend these practices to friends, neighbours, and family members by explaining the benefits of the practices in disease prevention and supporting the health and growth of their children. "I would tell them that you should feed the baby on a separate plate, so that you know what the baby has eaten because if you don't you may feel the baby has eaten more, and yet she has not eaten enough," said a rural mother. Other mothers also planned to share their own positive experiences with the new practices, demonstrate the new practices in breastfeeding and mashing food, and explain to others the ease of implementing the new practices. "I will explain to them the difference I have noticed between the time I used to breastfeed wrongly and now, when I have known how to breastfeed my baby and the benefits I have found," said an urban mother. Only one mother did not accept a recommendation. This mother said that she would not be able to afford adding fruits and vegetables to her child's diet and that her mother-in-law decides on the household food preparation.

Some mothers accepted the recommendations but did not try them. These recommendations and reasons for lack of implementation included the following:

- **Thicken the porridge by including groundnuts.** One mother was not able to afford or harvest groundnuts in time for the third visit, but she planned to do so in the future.
- **Stop giving sugary, non-nutritious drinks.** One mother had reduced the amount of the Super Shake given to her child, but she continued to give some because the child reached for it when she drank it.
- **Increase the amount of solids to at least 250 millilitres each meal.** Although three women reported giving their children the minimum of 250 millilitres for each meal, their dietary recalls did not show such an increase.
- **Increase servings of mashed fruits and vegetables.** Five mothers reported that they were not able to afford or grow enough fruits and vegetables to meet the requirement.
- **Increase servings of mashed protein.** Five mothers were not able to afford or find additional sources of protein.
- **Increase the number of daily meals or snacks.** One mother was not able to afford any additional meals or snacks.
- **Boil or chlorinate water for drinking or for cleaning dishes.** One mother did not chlorinate her water because she could not afford the chlorine and thought boiling would take too long.
- **Store drinking water in a closed or narrow-mouthed container.** One mother was not able to afford to buy a new container, but she planned to do so in the future.
- **Wash hands with soap before feeding the child and after using the toilet.** One mother said that she forgot the recommendation and did not buy soap.

Summary

The following concludes the key findings based on the above analysis:

- **Breastfeeding.** All of the mothers were still nursing, with an average of nine sessions per day and 10 minutes per session. On average, mothers planned to breastfeed for 20 months. Many more women nurse on a fixed schedule as compared to mothers with children aged 0–5 months. Several mothers need to increase the length of each session and use and empty both breasts.
- **Replacement or Complementary feeding.** All but one mother provided their children with solid meals. Most meals included porridge or nshima. Several mothers were still providing watery porridge rather than thick porridge with groundnuts. On average, mothers gave their children three meals a day, but many were lacking in mashed fruits, vegetables, and proteins. Many mothers stated that the lack of funds and local availability of certain foods was a cause for deficiencies in their children's diets. Mothers also based their decisions on children's interest in specific foods and past experience caring for children. Many children eat with their families from a shared plate. Many mothers exhibited force-feeding of their children.
- **Maternal diet.** Most mothers do not adjust their diets for breastfeeding, although a few reported increasing their solid and liquid intake and focusing on a balanced diet with vegetables and protein.
- **Hygiene and illness.** Many mothers also demonstrated poor hygiene by not washing their own hands with soap before feeding their children or not washing their children's hands with soap. Some households failed to properly treat water for drinking and for cleaning dishes, despite recommendations to do so. Mothers most commonly explained that they would feed their children less frequently when ill, despite the efforts of some to force-feed.
- **Personal influencers and common beliefs.** The beliefs and behaviours of mothers appear to be influenced by a range of other individuals, but most commonly by the health clinic staff. Many mothers believe that breast milk is an important nutritional option for their children. Mothers most commonly cited teething as a cause for diarrhoea, and many believed that they need to give their children water after solids to help the digestion and cleaning process. Household chores and other responsibilities also affected mothers' abilities to practise healthy nutrition and hygiene.
- **Food availability.** Overall, mothers played the most significant role in deciding on the food prepared for the family, with strong support from their husbands. However, food availability, particularly the availability of some fruits and vegetables, appears to have a notable influence on the ability of mothers to implement recommendations.
- **Urban vs. rural.** Mothers in urban and rural locations reported food shortages, reduced portions, and increased costs for purchased foods during times of food shortages. The only notable differences in nutrition behaviours were a higher rate of urban mothers providing an insufficient amount of protein to their children and not properly treating water.

Mother of Child Aged 9–11 Months

The following is an analysis of the interviews and observations of 19 out of 24 mothers of children aged 9–11 months. Ten of the women were from rural locations, and nine were from urban locations. Five of the transcripts were not transcribed; their results are not included in this assessment.

Common Nutrition Behaviours

Breastfeeding

Most of the mothers are still breastfeeding their children in this age group and complementing with other foods. The frequency of breastfeeding sessions ranged from 5 to 15 times a day, with an average of 10 sessions per day. One of the mothers indicated that she was not breastfeeding because she was pregnant, and another mother explained that work schedule prevented her from continuing to breastfeed. Many of the mothers introduced other foods and fluids when the child was 6 months old. Based on the observations, mothers did not seem uncomfortable breastfeeding. However, it was noted during several of interviews that some of the mothers breastfed their child for a short period of time, only used one breast during the feeding session, did not empty out their breast milk, and did not have a fixed schedule for breastfeeding their child. When asked how long they plan to breastfeed, mothers commonly responded that they plan to stop breastfeeding when the child is about 18 to 24 months of age.

Replacement or Complementary Feeding

All of the mothers had introduced their 9- to 11-month-old child to other foods and liquids. More than half of the mothers indicated that they introduced their child to other foods at 6 months of age. Frequently, mothers mentioned, “We were told at the clinic that we could only give the children water or food when they turn 6 months.” The common food given was porridge with groundnuts, nshima with bean soup, kapenta soup, meat soup, and a variety of vegetable cooking water. Several of the mothers tended to feed their child watery porridge and need to add more flour or enrich the porridge with groundnuts. Children were generally given at least three meals a day, with two to three snacks between meals. Two of the mothers mentioned giving their child fruit juice or okra. Mothers commonly boiled their child’s meals. Based on the observation and interviews, many of the mothers are not aware that foods should be soft and cut into small pieces. Some of the children’s diets lack animal protein such as eggs, meats, chicken, and fish.

Most of the children in this age group were served on a separate plate, and several of them feed themselves. Two of the children were fed by another family member, an older brother and a caregiver. For children who were able to pick up food, they were served small portions. A few mothers who let their children feed themselves often are not vigilant about how the children feed themselves and do not realise that their children may not be getting an adequate amount of food. When asked how mothers knew when the child was full, they said that the child would indicate either by refusing to eat or pushing the plate away. One rural mother said, “The baby starts refusing to eat when she is being fed.”

Maternal Diet

Mothers stressed that the diet of a nursing mother is not different from the rest of the family members. Mothers agreed that a nursing mother should have a nutritious, balanced diet. Several mothers commented, "She [breastfeeding mother] needs to have breakfast every day, all meals at close intervals." Based on the observations and interviews, the most commonly consumed foods by mothers included nshima, porridge, eggs, fish, sweet potatoes, rape, cassava leaves, kapenta, munkoyo, rice, fritters, buns, tea, and biscuits. A few of the dietary recalls for the breastfeeding mothers revealed that some of the mothers did not consume enough food and liquids in their diet.

Hygiene and Illness

Most of the mothers indicated that their child had been sick at one point since birth. Common illnesses included diarrhoea, cough, and flu. Only one mother indicated that her child had malaria. Several of the mothers indicated that when their children are sick, they lose their appetites. To address the loss of appetite, mothers will supplement foods with liquids and reinforce breastfeeding to prevent dehydration. A few mothers mentioned trying to force-feed their child. In general, all of the mothers reported taking their child to all of the necessary under-5 check-ups.

Most mothers do not practise safe hygiene behaviours. The majority of the mothers use water that is drawn from a borehole or a well. The water is not treated nor kept in covered containers. Often, the trials revealed that many of the mothers did not boil or chlorinate water for drinking or for cleaning dishes. A vast majority of the mothers and children did not wash their hands with soap. Repeatedly, mothers mentioned the importance that hygiene plays in preventing illness. Several mothers mentioned, "What causes children to get diarrhoea is water. If chlorine is not added to the water the child might get malaria." However, very few mothers practised good hygiene behaviours, such as washing their hands before feeding a child or preparing foods. A few mothers attributed child illnesses to teething, changes in climate, or children eating dirt. One mother mentioned that she avoids giving her children leftover foods to prevent illnesses. For the most part, mothers did not associate their own child's illnesses with the hygiene behaviours practised in the home.

Most mothers believed that their children are healthy and growing well if they do not show physical signs of illness and if they have a strong appetite. Commonly, several mothers described their child's health as "healthy." If the child was eating and happy, then the child was in good health. "My child eats, she plays, and she has a lot of appetite. She is healthy." Two of the mothers reported that they were concerned about their child's growth because the child was not eating and had lost weight at the last under-5 check-up. Mothers are aware that a nutritious diet has a positive influence on a child's growth and health status. All of the mothers in this group of interviews stated that they make sure to take their child to all under-5 visits and they genuinely express an eagerness and willingness to put in place behaviours that will have positive effects on their child's growth and health status.

Underlying Factors

Common Beliefs About Nutrition of Mother and Child

A trusted source is considered to be staff from local health clinics that provide mothers with health information on breastfeeding practices and child nutrition. Mothers reported receiving information during ANC and their child's under-5 medical visits. Several mothers commented that they rely on the clinic to tell them when to take their child for a check-up: "They announce when to take the children to the clinic. I go every month when they tell us to go. I do not skip." Mothers generally reported seeking ANC during their pregnancy, and on average mothers received care at least two or three times during their pregnancy. Other trusted sources of information are family members such as parents, friends, and community elders. Most of the mothers were not aware of local forums where women come together to get information on child and maternal nutrition.

Food Availability

Most of the mothers indicated that season of the year influences the availability of certain foods grown locally. Several mothers commented that during the rainy season it's difficult to grown certain foods such as rape and spinach. "When it's very cold, you can't grow certain vegetables, and though you can grow things like cabbage and all, but when it's rainy season as well you can't grow things like rape, spinach—it's a bit hard for them." During the season when certain foods are scarce or hard to grow or purchase, mothers will adapt their diet by substituting with other vegetables such as cassava and pumpkin. The only notable difference in food availability is that mothers in urban areas do not report any limitation on availability of foods. However, mothers from rural areas did mention that during the dry season of September through November, there is a limit on the variety of vegetables that are readily available.

One of the biggest challenges mothers face is being able to afford food. A few mothers commented that little or no income is a challenge they frequently encounter and influences what types of food they can buy for their family. Several mothers commented, "I look at the situation and how much money we have and then decide on what [foods] to buy." As a way to address this concern, some mothers indicated that they grow their own vegetables or will sometimes reduce food portions and the number of meals the family consumes.

Based on the observations and interviews, about half of the women have their own garden where they cultivate their own foods or raise animals such as chickens, goats and pigs. Some of the foods they grow include beans, chibwabwa, maize, onions, groundnuts, rape, and sweet potatoes. One rural mother commented, "We are garden growers, so all our food comes from there: beans, cabbage, potatoes, rape, Chinese mustard leaves."

Mothers are the primary decision makers on what foods are prepared and cooked, and on the feeding practices of the family. Husbands and male partners are primarily income providers for the family, but are very supportive of their wife or female partner's decisions regarding nutrition practices. Other family members, such as mothers-in-law or grandmothers, also influence the types of food that are cooked and prepared in a household, as well as the feeding practices for infants.

Recommendations and Results in Nutrition Behaviour Change

Table 9 illustrates the recommendations made for change in nutrition and hygiene related behaviours and the participants' responses to these recommendations.

Table 9: Recommendations and Results for Mothers of Children Aged 9–11 Months

Recommendations	Offered	Accepted	Tried	Liked	Adopted
Child Nutrition					
Increase the number of breastfeeds					
• Urban	2	2	2	2	2
• Rural	2	2	2	2	2
Use and empty each breast for each session					
• Urban	1	1	1	1	1
• Rural	2	2	2	2	2
Increase the length of breastfeeds					
• Urban	0	0	0	0	0
• Rural	2	2	2	2	2
Feed the baby thick porridge mixed with groundnuts					
• Urban	3	3	3	3	3
• Rural	1	1	1	1	1
Recommendations	**Offered**	**Accepted**	**Tried**	**Liked**	**Adopted**
Feed the baby more fruits and vegetables					
• Urban	1	1	1	1	1
• Rural	2	2	1	2	1
Feed the baby a boiled or fried egg					
• Urban	1	1	1	1	1
• Rural	1	0	0	0	0
Increase servings of protein such as chicken, meats, and fish					
• Urban	3	3	2	2	2
• Rural	1	1	1	1	1
Feed the baby a least three main meals a day					
• Urban	1	1	1	1	1
• Rural	4	4	4	4	4
Mash the baby's food					
• Urban	3	3	3	3	3
• Rural	2	2	2	2	2
Feed the baby the same foods prepared for family					
• Urban	1	1	1	1	1
• Rural	2	2	2	2	2
Feed the baby in his/her own					

plate • Urban • Rural	2 1	2 1	2 1	2 1	2 1
Maternal Diet					
Increase servings of fruits and vegetables • Urban • Rural	1 0	1 0	1 0	1 0	1 0
Increase servings of protein such as chicken, meats, and fish • Urban • Rural	2 1	2 1	1 1	1 1	1 1
Increase the number of daily meals or snacks • Urban • Rural	2 1	2 1	1 1	1 1	1 1
Increase liquids • Urban • Rural	0 1	0 1	0 1	0 1	0 1

Recommendations	Offered	Accepted	Tried	Liked	Adopted
Hygiene					
Wash hands before feeding the child and after using the toilet • Urban • Rural	2 6	2 6	2 6	2 6	2 6
Boil or chlorinate water for drinking or for cleaning dishes • Urban • Rural	3 2	3 2	3 1	3 2	3 1
Store drinking water in closed or narrow-mouthed container • Urban • Rural	4 3	4 3	4 2	4 3	4 2

Specific Changes in Child and Maternal Diet

Table 10 outlines the changes that mothers were able to make in their diets based on their dietary recalls.

Table 10: Specific Changes in Maternal and Child Diet

Recommendation	First Visit Total Daily Recall	Third Visit Total Daily Recall
Child's Diet		
Increase the number of breastfeeds • Mother 1 • Mother 2 • Mother 3	• 9 feeds • 8 feeds • 10 feeds	• 12 feeds • 10 feeds • 19 feeds
Increase servings of protein such as chicken, meats, and fish • Mother 4 • Mother 5	• No protein	• Dry fish (twice a week) • Chicken (1 piece) • Fish (1 piece)
Increase the number of daily meals or snacks • Mother 6	• Porridge with groundnuts (250 millilitres once a day) • Nshima (125 millilitres) • Chisense (125 millilitres) • Nshima (125 millilitres) • Rape (200 millilitres)	• Porridge (250 millilitres twice a day) • Sweet potatoes (250 millilitres) • Nshima (150 millilitres) • Fish and duck (100 millilitres) • Nshima (150 millilitres) • Fish (100 millilitres)

Recommendation	First Visit Total Daily Recall	Third Visit Total Daily Recall
Maternal Diet		
Increase the number of meals and/or snacks • Mother 1	• Porridge (375 millilitres) • Nshima/rape (2 serving spoons) • Water (3 times a day) • Nshima/beans (2 serving spoons) • Tobwa (500 millilitres) once a week • Sweet scorns (2 pieces twice a week) • Dry maize grains (125 millilitres once a week)	• Porridge (300 millilitres twice a day) • Sweet potatoes (1 potato) • Water (3 times a day) • Nshima/cabbage (200 millilitres) • Fritter (1) • Bananas (4) • Nshima/fresh fish (120 millilitres) • Nshima/kapenta (120 millilitres) • Rape (120 millilitres once a week) • Potatoes (250 milligrams twice a week) • Okra (120 millilitres twice a week)

		• Chicken (80 milligrams once a week) • Cowpeas (200 milligrams twice a week) • Dry maize grains (125 milligrams twice a week)
• Mother 2	• Paw paw • Nshima/cabbage/fish mixed (3 lumps)	• Paw paw (250 millilitres) • Nshima (500 millilitres) with rape (500 millilitres) • Rape (300 millilitres) • Avocado and pear (300 millilitres) • Nshima (500 millilitres) with rape (550 millilitres) • Sweet potatoes (400 millilitres) with sugar solution (300 millilitres) • Meat (200 millilitres) once a week • Beef (1/4 of 250 millilitres) once a week • Eggs (1/2 of 250 millilitres) once a week • Super Shake 1/2 of 250 millilitres) once a week

Recommendation	First Visit Total Daily Recall	Third Visit Total Daily Recall
• Mother 3	• Nshima/rape (2 lumps) • Water (300 millilitres 3 times a day) • Nshima with beans (2½ lumps) • No fruits	• Porridge with groundnuts (300 millilitres) • Mpundu (300 millilitres) • Nshima, Chinese cabbage (3 lumps) • Nishal beans (3 lumps) • Porridge (250 millilitres) • Nshima with rape (3 lumps) • Water (300 millilitres 4 times a day) • Banana (1)
Increase servings of protein such as chicken, meats, and fish • Mother 1	• No protein sources	• Nshima with chicken (3 lumps) • Nshima with rape (3 lumps)
Increase the amount of liquids • Mother 3	• No liquids	• Tea (1 mug) • Soup (250 millilitres)

Examination of Recommendations and Results

The most common recommendations for child nutrition included

- Increase length of breastfeeds for longer periods and empty both breasts,
- Feed the baby thick porridge mixed with groundnuts,
- Increase the number of servings of fruits and vegetables,
- Increase the number of meals daily, and
- Increase the number of servings of protein such as eggs, meats, and fish.

The most common recommendations for maternal nutrition included

- Increase servings of protein such as chicken, meats, and fish; and
- Increase the number of meals and snacks daily.

The most common recommendations for hygiene included

- Wash hands before preparing foods or feeding the child, and
- Boil or chlorinate water for drinking or for cleaning dishes.

All of the mothers were receptive to the nutrition recommendations that were offered, and all expressed a willingness to try them. A few of the mothers were doubtful that financially they could implement these new practices because implementation required additional meals. Several of the women who were asked to increase breastfeeding time mentioned that they noticed immediate changes in their baby's temper; the child was happier and less fussy. For these mothers, it was rewarding to see that a simple change in their breastfeeding practice had such a positive outcome. "It was good, and I managed, and it is going well. I liked it because the baby is satisfied and does not cry." As for hygiene recommendations, such as boiling and storing drinking water in closed or narrow-mouthed containers, all but one of the mothers was storing drinking water in a container. However, the containers were not covered. A simple recommendation of using a lid or covering the water was accepted, tried, and adopted by these women.

Many of the mothers expressed that they received a positive response and support from their husband, male partner, and family members and were highly motivated that they would recommend the new practices to other family members, friends, and neighbours. One mother shared her husband's positive comment on boiling drinking water: "You have brought a good teaching lesson because children, they normally suffer from diarrhoea." Most mothers would try to convince others of the new behaviours by focusing on the benefits of the new behaviours on the maternal and child health. One mother said, "I would tell them that I managed, and that if they try this method, their babies will be growing healthy."

Most of the mothers accepted the recommendations but did not try them. These recommendations and reasons for lack of implementation included

- **Increase servings of fruits and vegetables.** One mother reported that she was not able to afford the fruits and vegetables.

- **Increase the amount of proteins such as eggs, meats, and fish.** One mother reported not being able to afford buying proteins. A second mother reported that she would not try or accept the recommendation of feeding the baby a boiled or fried egg at any meal because a witch doctor told her not to eat eggs. This was a personal belief of the family.
- **Boil or chlorinate the water.** One mother did not buy chlorine to treat the water because chlorine is not sold in the area. She reported that she is aware that she should boil the water but admits to sometimes forgetting to put the recommendation into practice.
- **Store drinking water in a closed or narrow-mouthed container.** One mother reported not having a container to store drinking water.

Summary

The following are the key findings based on the above analysis:

- **Breastfeeding.** Most of the mothers were still breastfeeding their children aged 9–11 months, although the feeds were less frequent and shorter. Most of the mothers were breastfeeding on demand. Mothers need to improve the quality of the breastfeeding sessions by increasing the length of breastfeeding and ensuring that they empty both breasts at every breastfeeding session.
- **Complementary feeding.** Mothers have transitioned their children to solid foods. However, mothers lack awareness of the importance of introducing a variety of solid foods into their children's diets. Many of the mothers do not mash up their children's food. In addition, mothers who let their child self-feed often are not very vigilant about the feeding practices of their baby and do not realise that he or she may not be getting an adequate amount of food.
- **Hygiene and illness.** Many of the mothers displayed poor hygiene by not washing their hands before they fed a child, when they were preparing food, or after using the toilet. They also did not boil or properly treat their drinking water that is drawn from unsafe sources, such as a borehole or well.
- **Maternal nutrition.** Mothers are aware of the importance of maintaining a nutritious diet and agreed that a nursing mother should have a nutritious, balanced diet. Mothers do strive to keep a balanced diet. A few of the women need guidance on proper nutrition intake for nursing mothers.
- **Nutrition decision making.** Mothers are primarily responsible for what food is cooked and prepared for the family. They are the key decision makers in providing balanced nutrition to children in the family.
- **Urban vs. rural.** In this group of interviews, there were two notable differences amongst urban and rural locations. First, the season of the year has an impact on the availability of foods. Mothers in rural areas reported that during the rainy season there is less variety of foods. Mothers in urban areas commonly reported that they did not encounter any limitations in food availability. The second notable difference is the nutritional recommendations offered to the

women. Mothers from urban areas were asked to increase proteins in their diet. Mothers not eating a sufficient amount of proteins could be attributed to financially not being able to purchase proteins such as meats, chicken, or fish. However, mothers in rural areas were asked to increase the number of meals they consume on a daily basis. Mothers not eating a sufficient amount of meals may be a result of mothers often working in the fields, being too occupied with household chores, or placing the nutritional needs of their children and the rest of the family first.

Mothers of Children Aged 12–23 Months

The following is an analysis of interviews and observations of 23 mothers of children 12–23 months of age. Ten mothers were in urban locations, and 12 mothers were in rural locations. Three of these mothers were not available for the third visit; therefore, the data on their responses to the recommendations for change in nutrition and hygiene behaviours are not included in this report.

Common Nutrition Behaviours

Breastfeeding

The findings show a diverse range of behaviours and practices related to the feeding of children aged 12–23 months. The majority of mothers were still breastfeeding their children at the time of the interviews. Only about five mothers reported to have stopped breastfeeding their children. About two of these mothers stopped breastfeeding their children by 6 months, while the remaining three mothers stopped breastfeeding between 17 and 20 months. Mothers who were no longer breastfeeding varied in their reasoning for ending this practice. One mother in Mansa urban stopped breastfeeding her 18-month-old child because she was pregnant. "I became pregnant, and that's why I stopped breastfeeding." Some mothers ended breastfeeding because they believed that breastfeeding was preventing their children from consuming more solid foods. "When a child breastfeeds for a long period of time, they refuse to eat solid and more nutritious foods," said a mother in Lundazi rural.

HIV-positive women ended breastfeeding to prevent mother-to-child transmission of the HIV virus. One woman explained that she stopped breastfeeding when her child was 18 months old because the child was ill for a long time and refused to breastfeed. There was a time when he [my child] suffered from malaria, and while he was sick we noticed that he was avoiding the breast and porridge. During this period, his favourite foods became Maheu till he was well. So his grandmother advised me to stop him from breastfeeding, an idea which I was also in support of," said a mother of a 22-months-old child in Lundazi rural.

A mother of a 20-month-old child in Choma urban stopped breastfeeding for cosmetic reasons, fearing that extended breastfeeding would alter her physique. "I stopped breastfeeding because the child was just going to make me become very slim if he had continued [breastfeeding] the way he was sucking." Some women considered the cessation of breastfeeding before 2 years as a family norm. "I wean all my children when they are 22 months—that's the stage I wean all my children at," said a mother in Samfya rural. Some women stopped breastfeeding due to illness. "I had malaria and jaundice, so I went to Monze because my whole body had turned yellow, so the doctor thought I would pass the disease to the baby, and then they told me to stop breastfeeding him," said a mother of a 20-month-old child in Pemba rural. One pregnant woman from Lundazi urban believed that breastfeeding the child beyond 19 months may put the child at risk of contracting diseases from her, the mother. "[Breastfeeding the child up to 2 years] may bring more problems to the child since us women, we are found with various diseases."

Although most mothers were still breastfeeding their children aged 12–23 months, the breastfeeding sessions were normally short, lasting about 2 to 5 minutes. Mothers normally did not use and empty both breasts, and the sessions were commonly terminated by the child. From the observations, it appeared that the children enjoyed short breastfeeding sessions, used the sessions as a snack, and would end the session to resume playing.

Replacement or Supplement Feeding

Observations and self-reports from the women showed that, during the 12–23 months, most mothers slowly start transitioning the child to the feeding pattern of general family members. The mothers would start feeding the child the same food that was given to adults, and they would also start serving the child together with the entire family, because the child was seen to be able to eat most of the foods eaten by older members of the family. Mothers most commonly fed their children nshima served with different types of relish, which was not very different from what the whole family would eat for the day.

A mother of a 17-month-old child in Choma urban commented that "When eating porridge, I feed him myself. When I cook porridge, I put it on a small plate, I stir the porridge until it is almost cold, and then I put him on my laps—resting the child's head on my hand and holding both hands, making sure he does not move around until he finishes eating. As for nshima, I serve his lump of nshima on a small plate and cut them into smaller pieces after I wash my hands and put soup, vegetables, or any relish for that day on a separate plate. I then wash his hands and let him feed himself. When he is finished with eating, he gets up and comes to where I am. Then I would know that he had had enough and he is full."

The nshima would normally be served with bean soup, kapenta soup, meat soup, and vegetable cooking water. The children were normally given three to four meals a day, including snacks. Porridge was served twice a day and was considered the major meal for children. The porridge was normally enriched with groundnut powder, butter, oil, and in a few cases, soya bean powder. If mothers did not have anything to enrich the porridge, they normally fed plain porridge to their children, only adding salt and sugar if it was available.

Mothers fed the children according to a daily feeding schedule. However, the mothers also practised a lot of responsive feeding, which generally began when the child started to cry or showed signs of hunger and/or when special foods were available. "I follow a fixed schedule [for feeding the child]; I decide when to feed the child but sometimes I cannot control it when she starts crying," said a mother of a 17-month-old child. Similarly, a mother of a 12-month-old child in Mansa urban commented that "When she [the child] takes porridge in the morning, and around 10:00 hours if there is bread or rice I feed her; at lunchtime, 12:00 hours, I give nshima. Around 15:00 hours if there is any food I feed her again, things like oranges and bananas, and in the evening she eats nshima again." The in-between meals or snacks primarily included soft drinks, biscuits, fritters, bread, and in some cases fruits such as bananas and oranges.

In some cases, mothers fed the children, and in other instances, children fed themselves. In both cases, mothers did not make an effort to measure and separate out specific quantities of food for the child to eat but, rather, child would eat from a plate shared with the mother or whole family. "Actually, I don't hold him [when feeding], he sits on his own. I just give him food separately with two other children

from here that are just few months older than he is. So they share the plate of nshima, but each will have his own plate of relish. I always keep an eye on them [children] to make sure that he [the youngest child] eats and gets satisfied," said a mother of a 22-month-old child in Lundazi rural. Mothers fed their children from a shared plate to enhance the spirit of sharing amongst children and the entire family. They believed this eating arrangement symbolised oneness and love.

All of the women accepted the recommendation to use separate plates once they learnt about its importance in monitoring their children's dietary intake. When asked how they knew when the child was full, almost all of the mothers reported depending on cues from the child, such as refusing to eat any more, showing signs of vomiting, and pushing the plate away. Generally, mothers did not completely leave young children to feed unaided and they monitored the child. Mothers normally cut nshima into smaller pieces for the child to eat. However, mothers rarely mashed, chopped, or grated other solid foods such as meats and vegetables for their children. "I cut nshima into smaller pieces, then feed him; if it is sweet potatoes I cut into smaller pieces, then mix with peanut butter," said a mother of a 12-month-old child in Samfya rural. Many mothers would also only give cooking water (broth) to children, rather than the solid foods being cooked in the water. Mothers reported several reasons for not mashing their children's solid foods, such as hectic schedules, lack of knowledge, or the action not being the family norm. Some women believed that their children were not old enough to chew solid foods. "I am willing to feed the child solid foods like meat, chicken, and kapenta, but how is she [the child] going to chew because she doesn't have teeth?" asked a mother of a 14-month-old child from Pemba rural.

Most of the mothers fed their children. As already mentioned, very few mothers left their young children to feed unattended. The mothers would normally serve their children by cutting the nshima in small pieces to enable the young child to eat, and they would normally pay attention to see if the child was eating. "I sit down when feeding her. Sometimes I just give her a side plate to feed herself, when she is refusing to eat that's when I put her on my laps and feed her," said a mother of a 20-month-old child in Lundazi rural. In a few cases, the mother would assign the feeding of the young child to an older sibling, a maid, or any elderly person in the household. One woman specifically mentioned that she normally assigned the maid to feed the child because every time she fed the child, the child would concentrate on breastfeeding instead of eating solid foods.

Maternal Nutrition

Mothers of children aged 12–23 months did not eat any differently from the rest of the family. "There is no difference, we all eat the same food with the rest of the family," said a mother of a 17-month-old child in Chipata urban. Although a review of locally available foods revealed that women may be able to access a wide range of foods, their seven days dietary recall showed that mothers and their children ate the same types of food for many days. Common foods included nshima, kapenta, beans, fish, and rape. Several mothers believed that nursing mothers should eat greater quantities of food than the rest of the family to provide the much-needed nutrients for the mother and the baby. They also mentioned that it was important for a nursing mother to eat balanced meals with vegetables and protein. Several mothers stressed the importance of including milk, maheu, and vegetables enriched with groundnuts to

ensure that mothers produced more breast milk. "I usually think that a breastfeeding woman should eat more food than the rest of the family because if she doesn't then the baby will not have any milk to suck from; this is the difference which should be there," said a mother of a 17-month-old child in Choma urban. A few women also mentioned that nursing mothers should not consume any foods prepared with soda, such as okra, because it would reduce the amount of breast milk.

Most of the foods eaten by mothers and pregnant women were usually grown or readily available within their locations. Especially for rural mothers and pregnant women, most of the foods eaten were grown within their locations, and very little was bought or sourced from locations outside their communities. The urban women, however, obtained most of the food from the markets and supermarkets. This food was usually sourced from different locations, and some of it was actually imported. Rural women commonly reported that they eat some small animals found in their locations, such as mice, for a source of protein. The eating of such animals was very rare in the urban areas. Generally, both the rural and urban women ate food that was found in their communities.

Hygiene and Illness

Mothers drew their water from boreholes or shallow wells, and a few drew their water from taps. Most sources provided unsafe water, and many mothers did not chlorinate or boil the water. Some mothers felt that their water was fairly safe and therefore did not need to boil or treat it. "The water that I used to boil was drawn from the well, but I don't boil the one I draw from the kiosk because it is clean," said a mother of a 14-month-old child in Chipata urban. Mothers commonly stored water in wide-mouthed containers and kept a cup by the side of the containers for use by anyone who wanted to drink water. Because of this, young children were able to draw water on their own and consume contaminated water. Mothers and children rarely washed their hands with soap. Most mothers did not use a pitcher to pour water when washing hands before eating nshima; they washed their hands from the same vessel and used the same water. This meant that the first person, usually, the eldest washed their hands with clean water and the water would be very dirty by the time the youngest child washed their hands. Most mothers and their children rarely washed their hands before eating other food stuff such as fruits, fritters and other snacks. Only one household was observed to have a hand-washing station near the toilet.

Hygiene practices between the urban and rural women were not different. Neither the rural nor the urban women treated their drinking water, and they usually stored drinking water in wide-mouthed vessels. Most of the urban women reported that they do not treat their drinking water because they believed that the water was safe to drink, as it was treated from the source. This was usually the case for mothers who drew their water from the boreholes and from the tap. Most of the rural mothers could not clearly explain why they did not treat their drinking water despite drawing it from wells. One rural woman mentioned that she does not treat her drinking water because she had been using the water from the same well for a long time and had not experienced any health problems. She further added that the family usually starts treating their drinking water by boiling it when there is a cholera outbreak, which was not the case during the time the data collection team visited her house.

All mothers reported that their child had previously experienced an illness. Mothers mentioned diarrhoea, malaria, and coughing as the most common child illnesses. Most of the mothers were not clear about the causes of common child illnesses and at times regarded these illnesses as part of the normal development of a child. A vast majority of mothers said that diarrhoea is caused by teething. This is because children normally experienced regular episodes of diarrhoea during the teething stages, and women concluded that it was the growing teeth that caused the diarrhoea. During the teething stage, women felt that there is nothing they could do to prevent diarrhoea and, as such, they concentrated their efforts on providing remedial actions rather than preventative. Most mothers reported that they usually rush to the health centre whenever they notice diarrhoea, fever, vomiting, or any health-related problem in their child. Outside the teething period, mothers mentioned that children could get diarrhoea by eating cold food, drinking dirty water, and playing in dirt. "As for diarrhoea, I think it is caused by exposure to dirt. When he goes to play with his friends, he plays in dirt and sometimes he even eats the same dirt; so I think that is what causes him to have diarrhoea," said a mother of a 17-month-old child in Choma urban. Another mother in Choma also shared similar views and said, "If not teething, then what might cause diarrhoea is dirt or maybe when he has eaten something bad." And an urban mother also said, "The child can get diarrhoea if one feeds the child leftover food which was not covered, and it was exposed to dust, and if flies sat there, and then I just give my baby like that. In addition, for example, the way my child is sucking on the bottle, if that bottle is not cleaned and kept nicely, and flies are sitting there, and then I make milk and put in the bottle like that [without washing it], my baby can also have diarrhoea."

A few reported that they serve their children food when it is still hot and cover their food to avoid flies sitting on the food.

When a child is ill and displays little or no appetite, mothers indicated that they replace the child's solid foods with fluids and watery solids. Mothers reported trying to give their children different foods when ill and found that they would only consume foods such as watery porridge, Maheu, or other fizzy drinks. I feed him the same food, but, like I mentioned, I would buy Super Shake when he is ill," said a mother of a 20-month-old child in Pemba rural. In many cases, mothers practised force feeding during child illness. "[When my child is ill], I give him light porridge and I force him to eat nshima," said a mother of a 17-month-old child in Choma. A few mothers also mentioned that when the child is ill, they increase breastfeeds to complement the loss of appetite for other foods. "When he is sick, I breastfeed him more because he doesn't eat a lot of food when he's got diarrhoea," said a mother of an 18-month-old child in Choma urban. Many mothers, however, shared that they normally give less food when the child is ill. "[When the child is ill], I give less food and liquids because when child is sick she loses appetite and if you force her to eat a lot she might vomit," said a mother of a 12-month-old child in Samfya rural.

Underlying Factors

Personal Influencers and Common Beliefs

For the most part, mothers appeared to be influenced by health clinic staff during ANC sessions and under-5 education sessions. Mothers also relied on their friends, family, and the general elderly members of the community for advice. Group learning opportunities on nutrition were reported to be

nonexistent in communities. Many mothers expressed interest in attending group sessions on nutrition involving demonstrations on how to prepare local foods, as most mothers limited their cooking to what they knew, and they found it difficult to explore other ways due to lack of guidance.

Mothers who planned to breastfeed their children up to 2 years of age provided several reasons for this commitment. Most of the mothers demonstrated a belief that breast milk was a healthy option for children; therefore, they would prefer to breastfeed for as long as possible. They believed that breast milk had nutrients that assisted in children's healthy development and prevention of illnesses. "Sometimes, a child may have malnutrition due to early weaning. As a result, I will be forced to start queuing up for 'peanuts' (plump nuts given to children with malnutrition as a nutrition supplement)," said a mother in Chipata rural. A few mothers mentioned that they would breastfeed for as long as possible because they could not afford to buy the required supplementary foods or breast milk substitutes if the child was completely taken off the breast. "I will breastfeed for 2 years, so that the baby grows nicely. Because if you wean the child early but you don't have (nutritious) foods to give him/her the baby will not grow healthily," said a mother in Lundazi rural.

Some mothers also fed their child according his or her appetite. Some children were said to have very poor appetites such that mothers found it very difficult to feed them an adequate amount of food. This made mothers resort to feeding the children non-nutritive drinks and solids to ensure that they ate at least something.

Food taboos and customs forbidding the eating of certain foods were uncommon amongst mothers. Very few women mentioned foods that they do not eat, except in situations where they or their child had an allergy to some foods. About two women mentioned that they do not feed pork and kapenta to their child because they fear that the child will develop a rash and other allergies and illnesses. Others reported that they actually stopped eating foods such as game meat, pork, and some types of fish during pregnancy and during the nursing period to avoid causing allergies to the children when they were born.

Most mothers reported that they received support from their male partners, who were willing to support them in achieving good nutrition based on the nutrition recommendations by providing funds and offering encouragement.

Food Availability

Discussions with these mothers revealed a difference in the availability of foods in urban and rural areas. Mothers in urban areas did not find the availability of foods year round to be a problem, but they noticed an increase in prices in some foods during different seasons. For example, mothers mentioned that maize meal prices normally go up during the rainy season. Rural mothers mentioned similar increases in price in addition to less availability of certain types of foods depending on the season. During the rainy season, rural mothers were able to eat fresh vegetables, but after the rainy season, these would disappear and they would rely on dried vegetables for their meals. "We normally dry foods crops and eat them at a later stage when we need them," said a mother of a 22-month-old child in Lundazi rural. When less food was available, mothers normally prepared fewer meals per day and/or served smaller portions per meal. In severe situations where very limited food was available, mothers would prepare food for only the children, and the rest of the family would not eat. "We eat small

portions of food, especially relish, in order to leave some for the next meal," said a mother of a 17-month-old child in Samfya rural. For a source of vegetables, rural households normally grew their own from their fields, and they normally have a ready source of fresh vegetables during the rainy season. Rural households also reared chickens, goats, ducks, pigs, and cattle. There is usually a wide variety of vegetables grown during the rainy season, including pumpkin leaves, bean leaves, and sweet potato leaves. Rural households also had what they called Dimbas (gardens), where they grew other varieties of vegetables such as rape, cabbage, Impwa, sweet potatoes, and other irrigation crops. In the rural areas, they generally reserved the chickens for home consumption and sometimes sell them to buy other household needs, such as soap. The animals were usually preserved to sell in order to buy household requirements and to pay for larger bills such as school fees, transport costs, and other emergencies. The urban households rarely had fields to grow naturally irrigated vegetables; rather, they grew irrigated vegetables such as rape, Chinese cabbage, and cabbage. It was rare to find urban households rearing chickens, goats and pigs.

Mothers served as the primary decision maker for the preparation of food, with male partners supporting the mother by purchasing the food. "It's me who decide on what to eat and prepare—my husband just leaves money and tells me to decide on what to buy," said a mother in Chipata urban.

The decisions on the types of foods to prepare depended on accessibility, ability to afford, and the desire to vary the diet from day to day; a few women mentioned the desire to achieve a balanced diet. "I look at the money I have at hand; if I have enough, I buy vegetables and I go to town and buy fish," said a mother in Pemba rural. Some mothers mentioned that they buy food to achieve variety in the types of food they eat. "I will decide on what to buy according to how much money I have, sometimes I just think that today we'll have rape since yesterday we had Chinese cabbage, so that we make changes, but if I have money I decide properly. For example, I can decide that today we'll eat chicken and rape, the following day we'll eat fish and cabbage, then the next we'll eat beans and cabbage; so it all depends on the amount of money we have," said a mother of a 12-month-old child in Samfya rural.

A few mothers mentioned that they are aware of the healthy options for a child, but in most instances they lack the means to provide the food. Thus, mothers only fed the child what was in the house at the time, even if they knew it was not that nutritious. A mother of a 22-month-old child of Lundazi rural shared her reasons for failing to eat healthily and feed healthy foods to the child and commented that "We do receive different types of advice [on good nutrition], but because of difficulties in finding certain foods, it becomes very difficult to take every advice."

Recommendations and Results for Change in Nutrition Behaviours

Table 11 illustrates the recommendations made for change in nutrition and hygiene-related behaviours and the participants' responses to these recommendations.

Table 11: Recommendations and Results for Mothers of Children Aged 12–23 Months

Recommendation	Offered	Accepted	Tried	Liked	Adopted
Child Nutrition					
Serve solids on separate plate or bowl					
• Urban	3	3	3	3	3
• Rural	1	1	1	1	1
Stop giving sugary non-nutritive snacks					
• Urban	3	3	3	3	3
• Rural	4	4	3*	3*	3*
Increase the length of breastfeeds					
• Urban	1	1	1	1	1
• Rural	3	3	3	3	3
Increase the amount of solids to at least 250 millilitres each meal					
• Urban	1	1	0	0	0
• Rural	4	4	3	3	3

*This recommendation was given to participants who was not available for the third visit to assess the implementation of the recommendations and whose responses are not included in this number.

Recommendation	Offered	Accepted	Tried	Liked	Adopted
Stop giving cooking water to child. Rather, serve child mashed or chopped solids					
• Urban	5	5	3	3	3
• Rural	5	5	4	4	4
Increase number of meals to three main meals and two snacks					
• Urban	2	2	1	1	1
• Rural	2	2	1	1	1
Increase servings of fruits and vegetables					
• Urban	2	2	2	2	2
• Rural	6	6	6	6	6
Support and monitor child when eating					
• Urban	2	2	2	2	2
• Rural	1	1	1	1	1
Thicken child's porridge and enrich it with nutrients					
• Urban	2	2	2	2	2
• Rural	2	2	2	2	2
Hygiene					
Wash hands before feeding the child and after using the toilet					
• Urban	4	4	3	3	3
• Rural	2	2	2	2	2
Boil or chlorinate water for drinking or for cleaning dishes					
• Urban	6	6	5*	5*	5*
• Rural	5	5	5	5	5

Store drinking water in closed or narrow-mouthed container • Urban • Rural	 1 0	 1 0	 1 0	 1 0	 1 0
Install hand-washing station near the toilet • Urban • Rural	 0 2	 0 2	 0 2	 0 2	 0 2

Specific Changes in Child Diet

Table 12 outlines the changes that mothers were able to make in their children's diets, based on their dietary recalls.

Table 12: Specific Changes in Diet After Recommendations Were Implemented

Recommendation	First Visit	Second Visit
Stop non-nutritive foods to your child		
Mother 2	• Super Shake Maheu (125 millilitres)	• Natural yoghurt (188 millilitres) • Orange (half) • Banana (1)
Mother 8	• Jiggies, Super Shake Maheu	• Bananas (3) • Sweer beer (munkoyo) (70 millilitres)
Recommendation	**First Visit**	**Second Visit**
Mother 13	• super shake Maheu (750 millilitres)	• Bananas (3) • Oranges (4 in last 7 days) • Yoghurt (125 millilitres)
Mother 15	• Super Shake (250 millilitres) • Tea (80 millilitres) • Freezit (100 millilitres)	• Munkoyo (180 mililiters) • Jiggies (500 grams)
Mother 21	• Biscuits (4) • Sobo (750 millilitres) • Bananas (2 in last 7 days)	• Bananas (2 in last 24 hours)
Increase feeds to at least 250 millilitres at each meal		
Mother 2	• Custard porridge	• Custard porridge (250 millilitres)
Mother 3	• Nshima and porridge (100 millilitres)	• Porridge (188 millilitres) • Nshima (125 millilitres)
Mother 11	• Nshima (63 millilitres)	• Rice (250 millilitres) • Nshima (250 millilitres) • Porridge (125 millilitres)
Stop giving child only cooking water and give actual solid food by mashing, grinding, crushing, or chopping into smaller pieces		
Mother 2	• Chicken soup (2 tablespoons)	• Beans (4 tablespoons) • Fresh fish • Chicken soup/broth (2 tablespoons)
Mother 13	• Beef soup	• Chicken (1 piece)
Add or increase servings of fruits and vegetables		
Mother 2	• Rape (1 tablespoon) • Cabbage (half teaspoon)	• Orange (half) • Banana (1)

	• Bondwe (half tablespoon) • Bananas (3) • Oranges (4 in 7 days)	
Mother 5	• Vegetables (2 tablespoons)	• Banana (2) • Apple (1) • Vegetables (5 tablespoons) • Oranges (2 in last 7 days)
Mother 8	• No fruits	• Banana (1)
Mother 9	• Vegetables (125 millilitres) • Banana (1)	• Bananas (2) • Cassava leaves (2 tablespoons) • Pumpkin leaves (5 tablespoons in 7 days) • Paw paw (15 milligrams)
Mother 11	• Vegetables	• Vegetables • Bananas (5 in 7 days) • Apples (2 in 7 days)
Mother 15	• Bananas (6 in 7 days)	• Pumpkin leaves • Cabbage • Bananas (2)

Recommendation	First Visit	Second Visit
Mother 16	• Vegetables	• Vegetables • Oranges (7 in last 7 days) • Bananas (3 in last 7 days)
Mother 23	• No fruits	• Bananas (4 in 7 days)
Increase servings of eggs in child's diet		
Mother 2	• No egg	• Egg yolk (1)
Increase meals to three main meals and at least two snacks		
Mother 5	• 2 meals	• 4 meals
Mother 8	• 3 meals	• 4 meals
Mother 19	• 4 meals	• 5 meals
Give thick porridge enriched with nutritive additives		
Mother 15	• Watery porridge (300 millilitres)	• Thick porridge (250 millilitres)
Mother 18	• Maize meal and salt porridge (125 millilitres and 63 millilitres, respectively)	• Maize meal enriched with groundnut powder (500 millilitres)
Mother 19	• Thick maize meal porridge with sugar (250 millilitres)	• Maize meal porridge enriched with sugar, oil, and groundnuts (250 millilitres)
Increase breastfeeds to at least four during the day and four during the night		
Mother 18	• Breastfed 3 times in 24 hours	• 8 breastfeeds
Mother 20	• Breastfed 5 times in 24 hours	• 8 breastfeeds
Increase or add protein source foods to child's diet		
Mother 19	• No protein source food	• Nshima with kapenta • Porridge enriched with groundnuts

Examination of Recommendations and Results

The most common nutrition problems and associated recommendations for child nutrition included

- Children being fed cooking water; solid foods were usually not given to children or, if they were given, the food was not adequately mashed or chopped into sizeable pieces for children to be able to eat.
- Children were not fed snacks between meals.
- Children were not fed fruits and vegetables daily.
- Children were given non-nutritive foods (e.g., jiggies, biscuits), which were sometimes given as replacement for main meals or snacks.

The most common problems and associated recommendations for hygiene included

- Boil or chlorinate water for drinking and for washing the cooking and food-serving utensils;
- Wash hands before feeding the child, when handling food, and after using the toilet;
- Use clean water to wash hands every time you handle food and when eating and use running water and not collected water in a dish to wash hands before eating, and
- Store drinking water in narrow-mouthed vessels.

Most of the mothers accepted, tried, and adopted the recommended practices. The mothers were motivated to try the practices because of the promise of good health, especially for their children, if they improved their feeding practices. "[I] am able to practise [good nutrition and hygiene] because I want my child to start growing healthily," said a mother of a 17-month-old child in Samfya rural. After trying, mothers were able to see improvements in their children's health, increases in their appetite, and increases in their activity levels. Mothers received support to practise the recommendations from their male partners, mothers, mothers-in-law, and sisters. They said they would recommend these practices to their friends, neighbours, and family members. Despite that, some of the mothers were doubtful about their ability to afford additional meals; none of the mothers rejected a recommendation. The mothers who tried the practices mentioned that they would recommend the same practices to their family and friends who had children by sharing their experiences doing the practices and the benefits of the recommended behaviours. "I would tell them [my friends and neighbours] that because I boil my water, I no longer have diarrhoeas in my home," said a mother of a 17-month-old child in Lundazi urban.

A few mothers accepted the recommendations, but they did not try them. These recommendations and reasons for lack of implementation included the following:

- **Increase servings of mashed protein (solids).** Mothers started to chop or mash some solid foods to allow children to manage to eat. However, this practice was done selectively, depending on how easy it was to do so for a particular type of protein. Mothers particularly found it easier to mash beans than they did for kapenta and many other meat products.

Mothers continued serving their children cooking water, and some mothers said they forgot to mash the food.

- **Increase servings of mashed fruits and vegetables.** Most mothers failed to introduce fruits in the children's diet because they could not afford to buy them. Mothers also said that most of the wild fruits were not in season at the time.
- **Stop giving sugary and non-nutritive foods.** Some mothers continued to give fizzy and other non-nutritive drinks and solids such as jiggies and biscuits because they said that the child was too used to eating them. They said that it was difficult to change this practice all of a sudden, and so they needed more time.
- **Store drinking water in narrow-mouthed containers.** Only three mothers who previously were not practising this managed to start storing water in narrow-mouthed containers. The majority who were not able to practise this said that they did not have containers to store the water. From observations at the rural sites, it was difficult to find places where women could buy the containers. They usually would have to travel to the urban markets to purchase the containers in both the rural and the urban areas. Mothers just did not have the interest to buy the containers, as it was generally observed that the use of containers was not the norm amongst most of the respondents and their communities. For example, a mother in Mwase-Lundazi rural mentioned how difficult it was to get the children to adopt the practice of drinking water from a narrow-mouthed container: "These children don't accept change so easily. Even [if] you tell me that [they] don't drink this water [in a bucket], they don't understand—they will change with time."
- **Increase the number of meals or snacks.** Two mothers were not able to increase the number of meals and snacks because they were unable to afford additional meals for the child.
- **Wash hands with soap when handling food and after using the toilet.** Only one mother failed to implement this; she said she forgot to do so at the time of observation.

Summary

The following concludes the key findings based on the above analysis:

- **Breastfeeding.** Most of the mothers were still breastfeeding their children, although the feeds were less frequent and short. Most of the mothers were breastfeeding on demand. Mothers need to improve the quality of the breastfeeding sessions by increasing the length of breastfeeding and ensuring that they empty both breasts at every session.
- **Hygiene and illness.** Many mothers displayed poor hygiene by not washing their hands when they were handling food and after using the toilet, and they did not treat their drinking water despite drawing it from unsafe sources. Most mothers also washed their hands using the same vessel and did not change the water afterwards. Mothers offered their ill with reduced appetites more fluids and watery solids.

- **Influential factors.** Mothers predominately relied on health clinic staff to provide information on nutrition during ANC and under-5 appointments.
- **Nutrition decision making**. Mothers decided what to cook for the day; the decision on what to buy was influenced by the desire to achieve food variety for the family and to buy enough food for the entire household.
- **Urban vs. rural.** The trials revealed that rural mothers gave their children less protein and fruits, and smaller and less frequent meals.

Fathers of Children Aged 0–23 Months or Partners of Pregnant Women

Ten males were interviewed in this study. Three of the males were from rural areas, and seven were from urban areas.

General Feeding Practices

Breastfeeding

Based on the interviews, male partners and fathers are aware of the health benefits associated with exclusive breastfeeding, and many of them advocate that their wives and pregnant partners should breastfeed a baby. However, most of the males are not familiar with proper breastfeeding practices, such as how long a woman should breastfeed. A few mentioned learning from the local health clinics about breastfeeding a child for a minimum of 6 months and introducing other foods such as porridge when a child is 6 months old. Most rely on what their wife or pregnant partner learns from the health clinics or other family members.

> *"When we were coming out from the hospital [discharged after delivery], we were told that we should breastfeed up to 6 months; thereafter, we can start giving other kind of food, porridge, and water.*" (Chipata, urban, father of 7-month-old child)

> *"I have understood the points provided by health staff that the baby should be introduced to any solid foods after 6 months. They are even saying the baby should not even take water.*" (Mwase, rural, father of 4-month-old child)

Replacement or Complementary Feeding

Several of the fathers and male partners commented that their wife or partner does not exclusively breastfeed and that she most commonly supplements their 3- to 6-month-old child with porridge A few reported that the mother planned to or introduced the baby to food when the child was 4 months of age because the mother believed that she was not producing enough milk, and therefore the child needed Complementary food. One male participant explained that often women are easily influenced by other women and, therefore, they adopt feeding practices used by other women in the village.

> *"Plans to introduce baby to food when he is 4 months old because by then he will need some foods to add up on the milk, which may not be enough by that time, like oranges, and he will not be a problem when he grows."* (Choma, urban, father of 3-month-old child)

> *"The only thing that I observed at some point when the mother complained of not having enough milk in her breasts. It is for this reason that she introduced porridge to the baby."* (Mwase, rural, father of 4-month-old child)

> *"I strongly feel that she has more than enough [breast milk]. But the cause of this could be that our women are mostly influenced by friends to do what they do. As you may be aware of the village set-up like the one we are in, they are being influenced by other women, claiming that one cannot manage to breastfeed the child continuously, thinking that they will become so thin;*

hence, introducing porridge. Baby was 3 months and some weeks. He is taking porridge once in a day at lunchtime." (Mwase, rural, father of 4-month-old child)

Maternal Diet

Participants reported their beliefs about what a pregnant women or breastfeeding mother should eat. Several mentioned some of the food that a pregnant woman or breastfeeding mother should consume, such as vegetables with groundnuts, fish, nshima, porridge, fruits, and meats. For these men, a concern is being able to buy food. While they are aware that a pregnant woman and breastfeeding mother should maintain a nutritious diet, often the food is not available or the family cannot afford to buy it.

"I think she needs to eat a lot of vegetables with groundnuts (visashi), some eggs, fruits, and meat or chicken whenever we have the money to buy because that was what she was told at the clinic when had our first baby." (Pemba, rural, male partner of pregnant woman)

"Here there isn't much food [available]; it's just cassava meals, with vegetables, fish, nshima porridge, buns, maheu, and sweet potatoes" (rural, Father of 22-month-old child)

"When I get paid, we have made the budget. I buy four chickens and goat meat, eggs, kapenta, and groundnuts for her to eat mixed with food. I buy oranges, bananas, and orange juice. These are the only foods we can manage to eat all month. Yes, we eat cabbage, rape especially, katapa, even [kalembula] sweet potato leaves, and beans. Vegetables, like [kalembwa] sweet potato leaves, [chibwabwa], pumpkin leaves, Chinese cabbage—but for cabbage, she only eats with nshima." (rural,Father of 12-month-old child)

Role of Men on the Feeding Practices of Pregnant Women, Mother, and Children

Fathers and partners of pregnant women are the primary income providers for the family. A common response was that male partners make sure they find sources of income that will enable a family to buy and/or grow food to feed the entire family. A few of the fathers mentioned that they may suggest what foods to cook but, generally, they do not get involved in preparing or cooking the meals, or in the feeding practices of the family. They see themselves as the heads of household, making sure that the family has an adequate amount of food to eat. Feeding practices are generally left for the women to instil.

"I make sure that I provide for the family by finding sources of income that will enable us [to] have the food in the house." (Choma, urban, father of 2-year-old child)

"I *make sure that I do some piece work and provide money for buying food."* (Choma, urban, father of 3-month-old child)

"Mother decides what foods are given to the baby. Father role is to work to ensure that we have food in the house." (Mwase, rural, father of 4-month-old child)

"My role is to ensure that food is available because am the one who is working. I don't play any part in that because a kitchen issue is the duty of my wife. She has made the time table; I just eat whatever she has prepare[d] for the day." (Pemba, rural, male partner of pregnant woman)

As for eating arrangements in the household, mostly all eat together. Children are served separately on their own plate. This is primarily done so that children motivate each other to eat well and to avoid conflict with each other, especially amongst the younger children. However, for some, eating arrangements can be a challenge because often there is a lack of food or the family cannot afford to buy food.

Common Beliefs About Maternal and Child Nutrition

Overall, participants get health information from various sources, including through the local health clinic, through local church, or from other family members and friends. One respondent mentioned getting information from the television. Some of the common behaviours that fathers or partners of pregnant women have learnt include the importance of exclusive breastfeeding, introducing solid foods at 6 months, and preventing illness and diseases by maintaining good hygiene practices.

> *"At the clinic, she [the mother] was told that you can start giving solid foods when the baby is 6 months old, like giving porridge with pounded groundnuts, so between 3–5 months you just give fluids, then at 6 you start solid foods."* (Choma, urban, father of 24-month-old child)

> *"The church where we congregate is one of the churches that promote[s] health issues. And sometimes, especially Saturdays, we have some health tips on mothers and generally everyone. We learn about how adults can keep away from certain diseases that can be attracted by either shaking hands or something. There is some information that comes during that health period. Therefore, in responding to your question, we also get information at church on how one should breastfeed a child."* (Chipata, urban, father of 7-month-old child)

> *"Actually we got some advice from my elder sister who has some toddlers. She told us that maybe the baby was not getting enough milk from the breast, so we needed to supplement her with other foods."* (Pemba, rural, father of 11-month-old child)

> *"Yes, as a watch man at a clinic I have learnt a lot from what the nurse in charge tells the women, so I also tell my wife."* (Pemba, rural, male partner of pregnant woman)

> *"Yes, the time has not yet come [for introducing other foods to the baby]. According to the health tips provided by the health professionals that a baby should be introduced to other foods apart from breast milk after 6 months. Even water is not allowed. This is so because the baby has not reached the required level."* (Mwase, rural, father of 4-month-old child)

> "I *get information from the television adverts, and I also check out some documentaries and some time on the Internet."* (Pemba, rural, father of 11-month-old child)

A few males indicated that they were not aware of this information. One participant mentioned that, in their village, they don't have anyone to teach them about nutrition.

"No. I have not heard about that issue from the health centre. In fact, the information from the health centre is that they discourage babies to be taking porridge not until they are aged 6 completed months. This is coming from friends, and they do not know exactly what they are supposed to do. And this has affected a lot of people. I say so because there are some people who even introduce porridge to their babies at exactly 1 month after birth. This is happening [in this community]. This could be as a result of not having information." (Mwase, rural father of 4-month-old child)

"The only truth I can tell you is that we don't have anyone to teach us here in Choma, maybe the only place could be at the clinics where they are taught, but I don't know what they do." (Choma, urban, father of 3-month-old child)

Participants in this group did not directly address the issue of a child's growth, health, and survival. For them, a primary concern is making sure they can financially provide for the family so that a mother is able to buy food. They are aware that a healthy diet has a positive influence on a child's growth and health status. Participants' perception is that it is the mother's responsibility to oversee a child's growth, their health status, and survival.

Underlying Influential Factors

Major Factors That Influence the Feeding Practices for Infants and Children

Participants highlighted several major factors that influence feeding practices for infants and children. The first factor is having enough money to buy food. Repeatedly, fathers voiced their concerns that little or no income is a challenge they frequently encounter, and this influences the types of food they can buy for their children.

"I am a business man and we depend on sales from our business. But there are times when we have had bad sales and when it comes to issues of eating, that cannot be ignored. The demands of hunger are a daily challenge." (Chipata, urban, father of 7-month-old child)

"We look at how much money we [have] and we buy what we want to eat." (Rural, male partner of pregnant woman)

"It is quite difficult. And so it is so difficult for me because there is nothing that I am doing at the moment. We normally eat whatever that is available. My father works and every weekday we can't go without a meal. So parents are really supporting us." (Mwase, rural, father of 4-month-old child)

One participant indicated that his wife's return to work was a big influence on the breastfeeding practice; she will not be able to breastfeed frequently.

"We looked at it from this point of view, we were anticipating that we were going to shift from this place (Pemba to Livingstone) and my wife was going to start working immediately, so if

> *anything, she was not going to be breastfeeding so much because of work."* (Pemba, rural, father of 11-month-old child)

Another major influential factor is advice from grandmothers, elderly women, and other women in the community on feeding practices.

> *"Surely I have not seen him experiencing any illnesses; it is just because of the influences from fellow women in the community who claim that a breastfeeding mother would get thin if at all she continues breastfeeding without introducing any other foods to the baby such as porridge. They think that at least the baby will stay without breastfeeding, which is seen as time to rest for the mother. The reasoning is that the baby may become full and may not demand for breast milk from the mother at least for some hours, which gives the mother some breathing space. This is what they believe in, but I do not."* (Mwase, rural, father of 4-month-old child)

> *"The seniors, like the grandmothers and also people at the clinic, told the mother to give oranges because she was told that babies when they are between 3 and 4 months, they experience stomach aches and diarrhoea, so that's why they sometimes give oranges and grip water***."** (Choma, urban, father of 24-month-old child)

A few fathers mentioned that they assist their wife or their pregnant partner by helping out around the home with the children or by helping a pregnant woman with household chores to lighten her load at home.

> *"I ensure that I give her some rest in times of family time, so that she may realize good energy. The other thing is that I need to provide for her, so that she eats well. And also give her transport that would make her reduce on issues of walking too much, so that energy is preserved. Sometimes I provide her with the vehicle to go round if she has so much work to do. If she is going shopping, she must have a vehicle to go round and pick what she wants, at least for her easy movements. Though I can't say that I can make a good standard for her, but we try if at all you have a bit of some money, so that she realizes what she wants on her own time. Sometimes really you may not even know what kind of food your partner may need, but if you leave some money she may want to eat certain fruits or a cup of milk, she can do that. Really, if you support her in that way, she will feel more important as well."* (Chipata, urban male partner of pregnant woman)

"I support her in so many things in regard to my child's health, sometimes she forgets to take the child to under-5 clinic for weighing, and I make sure that groundnuts for the baby's porridge is available and other foods. As at now, I have started helping her with other jobs because like for me I work very hard in the farm, so since she's pregnant I have told her not to be working in the farm but just to concentrate on the cooking and drawing of water." (Pemba, rural, male partner of pregnant woman)

During the interviews with these individuals from rural areas, several participants repeatedly raised the issue that there is a lack of awareness and information about proper maternal and childhood nutrition. These men expressed a need for more outreach and education on nutrition for pregnant women,

mothers, and infants. A few agreed that often women adopt behaviour from elderly women in their family or from other women in the community who are misinformed or uneducated on safe feeding practices for both mother and child.

> *"There are a lot of people out there who lack information. Information is very important, without which people may not know. And so they [government] need to sensitise them on how to keep and look after their children. Children are being introduced to foods which maybe are not supposed to be given to them because they are lacking information. And so they [mothers] need to wait and understand what it is. I think the key point is ignorance. Most people around this place have not been to school. Usually, when they are being advised on such issues, they would relate them to their grandparents in the way they used to live by then. So their background also matters. So when they are taught, and it being that they spend much time in the village than it is at the health centre, they have a lot of people to tell them [women] wrong information in villages. This is the main problem."* (Mwase, rural father of 4-month-old child)

Summary

- **Breastfeeding.** Most fathers and male partners of pregnant women are aware of the importance and benefits of breastfeeding. Male partners overwhelmingly support breastfeeding efforts. However, male partners lack knowledge on proper feeding practices for young children.
- **Maternal diet.** Fathers and male partners see themselves as the primary income providers. Their role is to make sure that a pregnant woman or breastfeeding mother has money to buy food. They understand the need to have access to a variety of foods. However, a vast majority of the male partners did not display a common knowledge of special foods that should be available to pregnant women, breastfeeding mothers, and young children.
- **Common beliefs about maternal and child nutrition.** Common behaviours that fathers or partners of pregnant women have learnt include exclusive breastfeeding, introducing solids foods at 6 months, and preventing illnesses and diseases by maintaining good hygiene practices. However, fathers and male partners showed a lack of knowledge about proper infant feeding and hygiene practices. They primarily rely on what they and their wife/partner learn from their local health clinics about proper feeding practices. None of the men demonstrated any knowledge or awareness about proper hygiene practices.
- **Factors that influence the feeding practices for infants and children.** Male partners are cognisant that women adopt feeding practices from elderly women, mothers-in-law, and other women in the community. They stressed that there is a need for outreach and education on proper nutrition practices for both pregnant women and infants.

Grandmothers of Children Aged 0–23 Months/Elderly Women

A secondary audience for this study included grandmothers of children aged 0–23 months and elderly women. A group of 12 women were interviewed. For this report, findings for three of the interviews were not transcribed.

General Feeding Practices

Nutrition Advice for Pregnant Women/Mothers of Children Under 24 Months

With this secondary audience, IDIs were conducted to gain a better understanding of the role that grandmothers and elderly women play in the feeding practices of pregnant women, mothers, and children under the age of 2 years. Findings revealed that grandmothers play an essential role in influencing the feeding practices of pregnant women, mothers, and children under 2 years of age. Most of the women mentioned giving advice to their daughter or a young mother primarily around breastfeeding and how to breastfeed, as well as when to introduce the child to other fluids and foods such as porridge. The advice they provide is mainly based on their own experiences in raising children, and for some on what they learnt from their local health clinic. One rural grandmother said, "When my granddaughter was born, I gave advice to my daughter for that baby to grow well; she is supposed to be breastfed all the time."

When asked what type of advice they provide around breastfeeding, mostly all stated that they highly encourage their daughters or young mothers to breastfeed until 18 months to 2 years.

> *"If there is nothing wrong, she could breastfeed for 1 year, 6 months. It all depends on the woman, some even breastfeed for 2 years."* (Pemba, rural, grandmother of a 6-month-old child)

> *"We breastfeed for 1 year and 1 month. It simply means that the child old enough to stop breastfeeding."*

Several reported that they were aware of the important health benefits that the child would gain from breastfeeding. Several of these women mentioned advising their daughters to give the first milk (colostrum) to the baby. A grandmother in Choma said , *"I just told her that the first milk is the best milk which can build the baby's body."*

As for when to introduce foods or fluids to a child, all mentioned that they advise their daughters or young mothers to introduce foods such as porridge when the child is 6 months old. Some of the foods mentioned included porridge, groundnuts, and nshima with bean soup.

> *"Porridge. For those who have money and they can afford [it], they manage to buy modern mixtures of porridge. Others just soak mealie meal in water and then sieve it in a tea strainer to allow the fine liquid to come out, and that's what they would make porridge from or even add some groundnut powder to make it nice and the baby would eat."* (Pemba, rural, grandmother of 9-month-old child)

As for liquids, several of the women in this target audience mentioned giving an infant juice, Maheu, and munkoyo. One rural mother said, "When the child is 1 year, you can give munkoyo." A few of the women also mentioned using a baby formula such as S26 and lactogen to supplement. One woman mentioned that she believes giving an infant Mazoe (an orange soda) and Coca-Cola is fine.

Common Beliefs of Child Nutrition at Different Ages

These women advise their daughters and mothers to give children porridge and introduce other foods such as sweet potatoes, bananas, and oranges as the child grows. Repeatedly, several of the women shared that a child aged 6–12 months should be eating porridge on a more consistent basis and, as the child grows, a mother should be increasing the amount of food until a child is able to finish a whole plate of porridge.

> "*We give nshima, sweet potatoes, bananas when found."* (Rural, grandmother)
>
> *"We usually get groundnuts and mealie meal. We prepare porridge for her. Also bananas."* (Mansa urban, grandmother of 15-month-old child)

"We give nshima, sweet potatoes, bananas when found." (Samfya rural, grandmother of 14-month-old child)

Other foods for this age group included beans and dry fish. A few women stated that once a child is 1–2 years old, he or she should be eating all types of food, such as rice and chicken, and drinking fluids such as tea and chibwantu (or mukoyo).

> *"This time, sure, he eats nshima, but still he eats porridge with groundnuts; he hasn't stopped eating porridge which he will never stop eating, Super Shake also he drinks, but at times we cook chibwantu for him to be a snack. We also give him tea and bread, which he also likes."* (Choma urban, grandmother of 15-month-old child)
>
> *"Those can eat nshima and any kind of porridge. Then can even take tea and rice, even these modern drinks. They eat all that, anything that you cook. For us who grow food, those even eat sweet potatoes. They even manage to eat sump because they have teeth in the mouth. They eat chicken; there are a lot of foods that they can eat."* (Pemba rural, grandmother of 9-month-old child)

The women in these interviews did not directly address the issue of a child's growth, health, and survival. However, they are aware that a healthy diet has a positive influence on a child's growth and health status. Their primary role is to provide advice to their daughters on proper nutrition while pregnant or breastfeeding and to influence the types of food that is prepared and consumed in the household. They do not have direct control over a child's health.

> *"She [pregnant woman] is supposed to eat fruits which are needed and vegetables. Rape she can eat, cassava leaves, chiwawa [pumpkin leaves], beans, leaves, and fruits like bananas, and oranges."* (Choma urban, grandmother of 15-month-old child)

> *"I advise her to always be making 'chibwantu' for the production of breast milk, and also eat a lot of vegetables because when one eats vegetables there is always high production of breast milk and just any other foods that we can afford, like meat. If there's money, then she can also buy liver because it gives energy to the body, also different kinds of fruits because when she eats such foods then the baby would also be eating the vitamins through breast milk."* (Pemba rural, grandmother of 9-month-old)

Hygiene and Illness

During these interviews, the topic of hygiene was mentioned by several of the women. They stressed the importance of maintaining good cleaning practices in a household and preventing illnesses such as diarrhoea in infants and children. For them, it was important to teach and encourage their daughters and other young mothers to practise good hygiene behaviours, such as washing their hands before preparing food, boiling water to make sure that a child has clean drinking water, and keeping foods and water in a container and keeping it covered. Many of them stated that their daughters have incorporated these behaviours into their everyday activities.

> *"Cleanliness is the most important thing. Everywhere [should be clean], the food that the child eats should be clean and the water that she drinks*." (Pemba rural, grandmother of 4-month-old child)

> *"Water should be kept clean [by] putting in a container to keep it [water] cool; foods that have groundnut in them should not stay overnight. Others say to boil it [water]. Yes, she [my daughter] boils [water]."* (Mansa urban, grandmother of 15-month-old child)

When asked whether a child's diet or nutrition changes when he or she is ill, all participants agreed that a child's diet does change during an illness. Several women mentioned that if a child has diarrhoea, the child should be given bananas. Some of the other foods mentioned included oranges and fruits.

> *"[Mother should give the child] oranges, bananas, and other fruits…so that the baby feels better and recovers quickly from the illness."* (Pemba rural, grandmother of 6-month-old child)

Most of the women believe that if a child has diarrhoea, it is important to continuously rehydrate him or her with liquids such as porridge, and that a child should eat in short intervals so that the baby is not "weak." These women also mentioned giving a child tea. A few mentioned that they avoid giving children solid foods while they are experiencing diarrhoea. Several of the women stated that they advise giving the baby oranges. One respondent said that she tells her daughter to give the baby lemon juice with porridge. Others recommended providing rice and milk to the baby.

> *"What I do with my daughter is that when her child is ill, I always advise her on what food to buy and prepare for the child to try and see if the child can eat. I tell her to squeeze the lemon juice into the porridge, so that the child can eat, and also to help the child have some appetite for food."* (Pemba rural, grandmother of 9-month-old child)

Underlying Influential Factors

Food Availability

Grandmothers were queried on the availability of food and whether certain foods are available at certain times of the year. For a few of the women living in rural areas, they indicated that they grow their food. Some of the foods grown locally include maize, groundnuts, bananas, tomatoes, and onions. Typically, women in urban areas buy foods such as beans, milk, and vegetables.

> *"We do grow crops like groundnuts—it's just that this time we didn't have a good harvest; we also grew cow peas, but it got destroyed by the rains. And maize as well, we actually still have bags packed in the house. For those foods that we can manage to grow, that's much better for us. We also grow vegetables, tomatoes, and onions."* (Pemba rural, grandmother of 9-month-old child)

As for the impact of seasons on the food supply, women mentioned that there are different types of food that are available during various seasons of the year. For example, during the rainy season, mangoes and masuku are readily available. During the dry season, foods such as rape and cabbage are difficult to find. Many of the women seemed aware of what foods are not available at certain times of the year, and they find ways to adapt and find new foods to eat at that time.

For a small group of the women living in urban areas, lack of food was a concern. These women mentioned that when they were younger and raised in the fields, food was readily available. Now there are times during the year when there is a lack of available food. As for the role that grandmothers and/or elderly women play in the preparation of the food, many of them teach their daughters to cook or to prepare certain foods.

"I find the food and teach them how to feed the children." (Samfya rural, grandmother of 14-month-old child)

A few of the women mentioned teaching their daughters how to cook using maize, cassava, and groundnut, as well as teaching them how to prepare a mixture of locally available foods.

> "Yes, [I teach her] how to add groundnut using cooking oil, how to use chinkondia." (Mansa urban, grandmother of 15-month-old child)

> *"We make cassava meal, then we sieve it to be very fine, and I put it in a suitable container where I will be getting some for her and cover it because it's just for the baby with her spoon, so I get some and prepare some for her, and they give her to drink every day, and when that meal finishes I am supposed to find some more cassava meal for her."* (Samfya urban, grandmother of 16-month-old child)

Several of the grandmothers stated that their role is to often encourage their daughters to eat, especially if they are breastfeeding, and to make sure that there is enough food at home for the family to eat.

"I just encourage her to eat whatever food is available in the house; if it's vegetables, we would eat so that she can be healthy. She shouldn't be choosy when it comes to food because then she would not be a healthy person. We would eat vegetables together if there's meat just like that we would still eat." (Pemba rural, grandmother of 9-month-old child)

Summary

- **Breastfeeding.** Grandmothers and elderly women provide advice on breastfeeding. The majority are aware of the benefits of exclusive breastfeeding and encourage their daughters or young mothers to breastfeed their babies for a period of 18–24 months. Overall, these women continue to play a key role in making sure that pregnant women and young mothers know how to properly breastfeed their babies.
- **Maternal diet.** Grandmothers and elderly women do have an influence on the nutritional diet of pregnant women and breastfeeding mothers.
- **Child nutrition.** Most of the women stated that a child is first introduced to other foods and liquids at 6 months of age, and they recognize that a child's diet does gradually change as he or she gets older. Most women are advising their daughters or young mothers on the types of food to give their babies. However, these women lack insight into advising their daughters or young mothers to add more nutritious foods to a child's diet.
- **Hygiene and illness.** The majority of the women explained that they are aware of how hygiene affects a child's health. Many of these women stated that they are teaching their daughters and young mothers on the importance of proper hygiene.
- **Food availability.** Overall, grandmothers and elderly women play a significant role in deciding the kinds of food that are prepared, cooked, and consumed in a household. Food availability is sometimes a concern, particularly around the dry season, and is often limited to certain foods depending on the season. For a few, the lack of financial resources is the primary issue surrounding access to a larger variety of types of foods.

Conclusions

Breastfeeding

The study revealed that women practised most of the ideal breastfeeding behaviours. A vast majority of mothers of children aged 0–5 months exclusively breastfed and planned to breastfeed their children beyond the first year of life. Most of the mothers of children aged 6–23 months continued to breastfeed their children, with a reduction of daily frequency as the children age. Despite the illustrated commitment to breastfeeding, many mothers need to increase the length of breastfeeding sessions and make sure that they use and empty both breasts. Many mothers also need to improve their positioning to facilitate more effective feeding sessions. Results of the trials demonstrated that often children were not getting an adequate amount of breast milk and, by making simple changes in the duration and technique, mothers noticed an almost immediate difference in their children's disposition. Mothers seemed willing to adopt this recommendation of increasing feeding frequency and duration of feeding sessions.

Replacement or Complementary Feeding

Most mothers followed guidance in delaying the provision of solid foods until their child is 6 months old. However, mothers lack awareness of the importance of introducing a variety of nutritious foods into their children's diet. Most meals included porridge or nshima. Several mothers were still providing watery porridge, rather than thick porridge with groundnuts. Mothers are not aware of foods that can be used to enrich porridge given to children. They often feed their children non-nutritious foods, and many are lacking mashed fruits, vegetables, and proteins. Many of the mothers do not mash up their child's food. In many cases, mothers fed their children from a communal plate and did not account for the amount of food taken by their children.

Maternal Diet

Mothers do not adjust their diets during pregnancy or breastfeeding. Results of the trials demonstrated that mothers lack fruits, vegetables, and protein in their diets and have an overall insufficiency in the number of daily snacks and meals. Although mothers are cognisant that they should maintain a balanced diet, accessibility and affordability of certain foods prevents them from improving their daily intake.

Based on observations and interviews across the various target audiences, mothers are primarily responsible for buying and preparing the family food. Fathers are generally seen as the primary income provider, but they rely on their wife or female partner to make the decisions about which foods to buy and prepare. A vast majority of the male partners did not display a common knowledge of special foods that should be available to pregnant women, breastfeeding mothers, and young children.

Hygiene and Illness

This study illustrated that a vast majority of the mothers lack a firm understanding of the importance of specific hygiene behaviours and their role in preventing illnesses, particularly in children. Observations

revealed unhealthy practices including unclean water used for drinking, cooking, and cleaning; unsafe water storage; and lack of consistent hand washing with soap.

When asked about diet differences when a child is ill, a vast majority of the respondents reported that they give their child less food due to low appetite; they replace solid foods and mainly give them fluids and other watery solids. Some mothers reported reinforcing breastfeeding to avoid dehydration. A few mothers reported force-feeding with fluids and watery porridge when a child is ill. Mothers are not aware of what other foods can be given to a sick child. As a result, they resort to overfeeding or giving non-nutritious fluids such as sugary drinks.

Personal Influencers

Women most commonly viewed staff from local health clinics as a trusted source for health information on maternal and child nutrition. They also relied on their friends, family, and elderly women for information. Grandmothers and elder women provide advice to their daughters and young mothers on child feeding practices, such as when to introduce other foods and liquids to a child. In addition, they teach women and advise them on traditional cooking practices. However, they need to be more informed on what kinds of food, and how much food, pregnant women and breastfeeding mothers should consume.

Male partners also served as a source of support for women by purchasing healthy foods when funds were available. They also offered encouragement to implement behaviour change recommendations, but appeared to be unaware of the appropriate breastfeeding and nutritional guidelines for children, nursing mothers, and pregnant women.

Food Availability

Food availability and the ability to buy food are major concerns for all target audiences that participated in this study. Mothers are primarily responsible for the food prepared for the family, with strong support from their husbands. However, food availability, particularly some fruits and vegetables, appears to have a notable influence on the ability of mothers to implement recommendations. As illustrated in the findings, rural households experienced the greatest impact from seasonal food shortages. Certain seasons of the year, particularly the rainy season, place limitations on the availability of some foods by reducing the local accessibility of foods and increasing the cost of some foods for purchase. Male partners appeared to be most concerned about their ability to purchase and harvest healthy foods for their female partners and children. Some households established coping strategies such as drying foods in preparation for the shortages, while other households are forced to reduce the number and size of meals.

Results in Behaviour Change

Behaviours most easily changed in the trials, and most likely to change as a result of the campaign, include the following. All are associated with breastfeeding.

- Improve positioning for breastfeeding,

- Use and empty both breasts, and
- Increase length of feeding sessions.

Prior to the recommendations, mothers mentioned that their children appeared to be hungry despite their efforts to breastfeed frequently. In most cases, mothers were not aware of the need to improve how they breastfed their children. They seemed to be very receptive to the above recommendations and reported an increase in breast milk and a decrease in crying amongst children as a result of these changes.

Behaviours most difficult to change in the trials, and most likely requiring an approach focusing on strategies to address barriers, include the following:

- Increase fruits, vegetables, and proteins for mother and child;
- Increase the number of meals or snacks for mother and child;
- Increase the amount of food per meal or snack for mother and child; and
- Boil or chlorinate water.

Food availability served as a significant barrier for all of the recommendations pertaining to maternal and child diet. Although some of the women did not appear to be knowledgeable about the types and amounts of food needed for a nutritious diet, the results of the trials proved that local accessibility and affordability of certain foods year round deterred their interest in changing these behaviours.

In terms of treating water, some mothers demonstrated a belief that their water was safe for drinking, preparing food, and washing dishes. This belief could be exacerbated by another common belief that diarrhoea is caused by teething, and not unclean water or poor hygiene. After accepting the recommendation to treat water, mothers did not change this behaviour due to a lack of accessibility and affordability of chlorine or the perception that boiling would be time consuming.

Recommendations

Based on the findings of this study, CSH recommends the following for consideration when developing the campaign strategy and materials:

Messaging

Focus messaging on behaviours that proved to be most in need of change, as identified through the trials.

- Although mothers understand the importance of breastfeeding, they are not aware of proper positioning and need for the use of both breasts. Messaging should stress the importance of these practices and demonstrate that these changes will likely increase breast milk, and in turn satisfy their children's hunger and decrease their crying and frustration. Materials should include clear instructions and illustrations to demonstrate these recommendations.
- Messaging should also focus on the importance of balanced diets with fruits, vegetables, and proteins in sufficient amounts and number of meals or snacks on a daily basis. Stress the

importance of a proper diet to support the health of (1) pregnant women and their unborn children, (2) nursing mothers in need of calories to produce enough breast milk, and (3) the development of children under 2 years. Consider highlighting coping strategies as a means to achieve a nutritious diet. Strategies may include drying and storing foods in preparation for the times of food shortage or identifying healthy foods that can be harvested locally.

- Campaign materials should also include messaging on the importance on proper hygiene and its role in childhood illnesses—specifically the need to boil or chlorinate water for drinking, cooking, and cleaning dishes. Highlight the viable option of boiling water if chlorine is not accessible or affordable for the household. Focus on strategies for boiling water during times of the day when the mother would not feel rushed. Stress the link between unclean water and diarrhoea in children.

Consider creating supplementary materials or secondary messaging focusing on other healthy behaviours identified in this study, including

- Wash hands with soap before breastfeeding, preparing foods, or feeding children;
- Mash foods for children aged 6 months and over;
- Measure the child's food by providing separate dishes and not sharing from a family plate;
- Continue to feed their children when ill and try to increase fluids; and
- Stop the provision of non-nutritious foods and drinks (e.g., jiggies).

Consider encapsulating key campaign messages in vignettes of women who have changed their nutrition behaviours and have seen the benefits of these changes in their own health and that of the children. In the trials, many women planned on recommending the new behaviours by sharing their story.

Target Audiences

As initially identified, the primary campaign audiences should continue to be pregnant women and nursing mothers of children under 2 years of age. The study demonstrated that women are the primary decision makers on breastfeeding and the preparation of other foods. As the secondary audiences, male partners and elderly women also have proved to influence the diets of mothers and children. CSH should also consider adding health clinic staff as a secondary audience, as they were reported to be the most influential source of information on maternal and child nutrition.

Communication Channels

The vast majority of women cited interpersonal communications as the primary channel for information on nutrition. They mentioned primarily relying on staff at health clinics during ANC and under-5 appointments. Develop materials for health clinic staff that outline the common problems in the nutrition of pregnant women, nursing mothers, and children under 2 years and provide guidance on how to communicate specific behaviour changes to their patients. Guidance should be targeted at the primary audience, as well as the influential audiences of male partners and elderly women. Provide tools to assist clinic staff in discussions with their patients on an individual basis or in a group setting.

Consider developing materials to be distributed to patients at health clinics, that provide clear recommendations on specific behaviours related to nutrition and feature images to further illustrate the recommendations.

Another source of information, and possible channel, is other women in the community. To reach these women, consider community events that convene mothers and other influencers to share key campaign messages, demonstrate healthy feeding behaviours, and discuss strategies for addressing barriers such as food shortages and proper breastfeeding practices. Focus heavily on the demonstration of behaviours such as mashing foods for children, and distribute campaign materials at the event to reinforce the demonstration and allow women to share the practices with other mothers.

Interpersonal channels appear to be the most influential means for sharing information on nutrition. Although a limited number of participants discussed other types of communication channels, CSH may want to consider using other channels (e.g., radio or newspaper) as a means to help bolster its interpersonal communications and networking efforts.

Works Cited

Central Statistical Office (CSO), Ministry of Health, Tropical Diseases Research Center (TDRC), University of Zambia, and Macro International Inc. 2009. Zambia Demographic and Health Survey 2007. Calverton, Maryland, USA: CSO and Macro International Inc.

USAID (2003). *Analysis of food security, health and nutrition in Zamia* (Lusaka).